60th ANNIVERSARY OF THE WIRELESS INSTITUTE OF AUSTRALIA ISSUE

amateur radio

Vol. 38, No. 8

AUGUST, 1970

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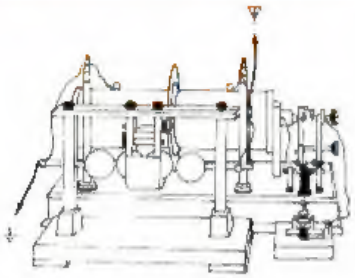

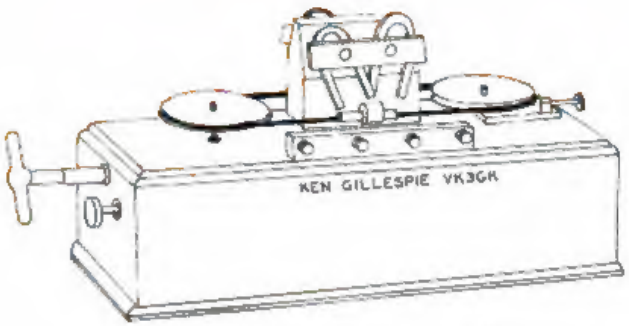

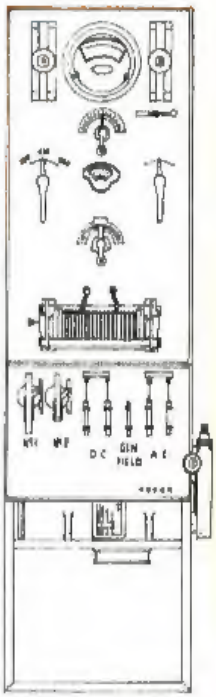

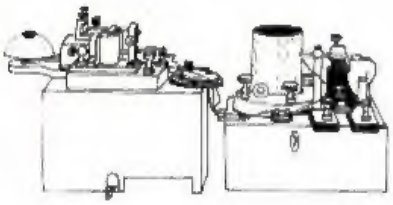

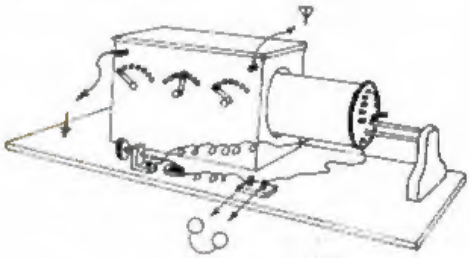

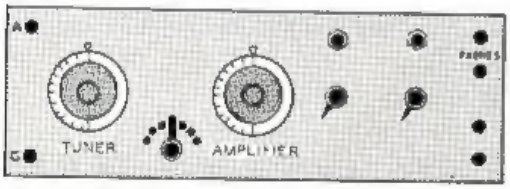

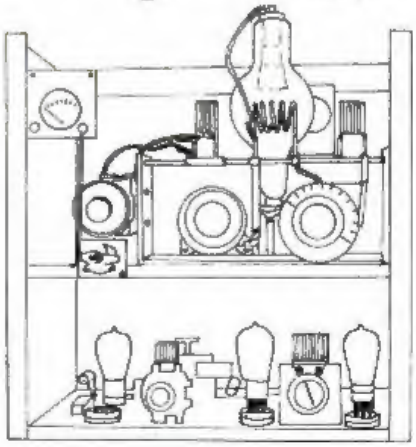

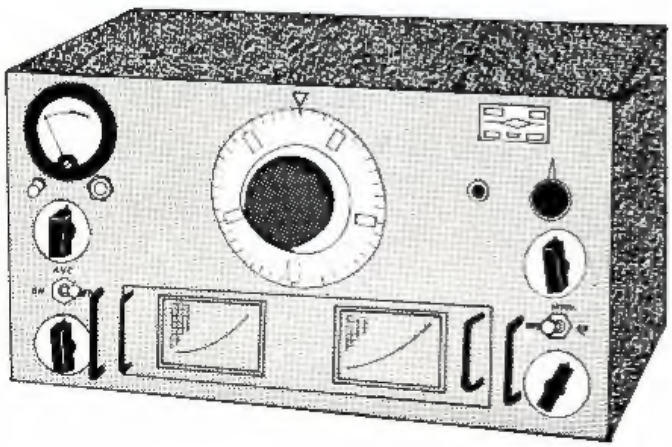

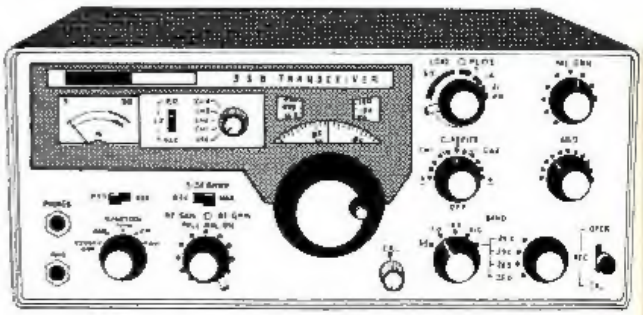

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6A7	15 ohms	" "	**$5.50**	"	40c
8A7	8 ohms	" "	**$7.20**	"	40c
8A7	15 ohms	" "	**$7.20**	"	40c
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900 feet	Mylar	**$2.80**
1200 feet	Mylar	**$3.75**
1800 feet	Mylar	**$5.75**
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1200 feet	Mylar	**$3.75**
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amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910

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Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence; in addition, "A.R." should also be notified. A convenient form is provided in the "Call Book".

CONTENTS

COVER STORY

A very brief History of Experimental Radio in Australia from Spark to S.S.B. Transceivers, undreamed of in the beginning of Wireless Communication. Further information on page 13.

60th Anniversary of the Wireless Institute of Australia

At the beginnings of Amateur Radio, Australia was a leader. This year we in the Wireless Institute of Australia celebrate the 60th Anniversary of an organised Amateur Radio Society in this country. Our beginnings predate those of both the Radio Society of Great Britain (founded 1913) and the American Radio Relay League (founded 1914), two of the most respected names in Amateur Radio. Australia thus was the first.

To celebrate this auspicious occasion a series of historical articles are being published in this magazine. The first, by Mr. G. Maxwell Hull, VK3ZS, a former Federal President, appeared in the March issue. In this **Special Historical Issue** old photographs and advertisements are reproduced together with a history of publications within Amateur bodies of Australia compiled by the Editor, Mr. Ken Pincott, VK3AFJ. These historical articles are commended to all Amateurs but in particular to the younger members of the fraternity —we have a history in respect of which we can be justifiably proud, but which demands of us today and those Amateurs to come in the future a high degree of achievements to match those of our forebears. Further articles of an historical nature will be featured throughout the year and there will be appeals from time to time for information to fill voids.

"Old Timers" particularly are urged to heed these appeals and contact their Division's Federal Councillor or the Federal Historical Officer if they are in a position to supply information, books, equipment, etc., that will help to complete the documentation of the Institute's history.

Australian Amateurs retained their leading status after W.W.I. in the 1920's with history making contacts between the Antipodes and England. The names of Charles Maclurcan (A2CM) and Max Howden (A3BQ) will forever be associated with these feats. Other names that arose in the 20's to become noteworthy later on included Ross Hull (A3JU) of "QST" and Ross Hull Contest fame, and Howard Kingsley Love (A3BM) who was responsible for the W.W.II. receiver type AR7.

In the more recent history of Amateur Radio, Australians have remained in the forefront of achievements. In 1966, Ray Naughton (VK3ATN), of Birchip, Victoria, proved conclusively that it was possible by using "moonbounce techniques" to communicate on an international scale on 144 MHz. He used relatively low power and by existing standards a comparatively unsophisticated antenna system and thereby confounded the critics who said that it could not be done. His contacts with the East coast of the U.S.A. remained the world record for E.M.E. work for some years. Of even more recent times was the resounding success of Australis Oscar 5, a satellite package designed and built by young Australians. This was the fifth Amateur satellite ever to be launched and the first one not built within the U.S.A.

Time does not stand still and to be successful neither can the Wireless Institute. Sixty years ago Australian Amateurs recognised the need for a formal organisation to represent their interests. Today this organisation is still successfully representing their interests. The introduction of such privileges as the use of r.t.t.y., slow scan t.v. and terrestial repeaters has occurred because of representations by the W.I.A.

The Institute proposed the optional use of the AX prefix in lieu of VK to celebrate the Cook Bi-Centenary celebrations during 1970. The officers of the Postmaster-General's Department acquiesced and no one can deny the success of this publicity throughout the world of Amateur Radio. Contacts seem to come easier and faster this year and the Institute's QSL Bureau managers are being more overworked than ever before.

The Institute's Cook Award is unique in that it is the first "limited time" award offered by the W.I.A. and already more than 475 certificates have been issued to Amateurs in 60 different countries—surely an impressive testimonial to the Award's acceptance and popularity.

On the administrative front the Institute is not found to be lacking either. For the first time in its long history the W.I.A. has sent its Federal President overseas in an official capacity. Mr. Michael Owen (VK3KI) is visiting the J.A.R.L., A.R.R.L., R.S.G.B., A.R.S.I., I.T.U. and others with a view to cementing relationship between these bodies and the Institute. In particular, he will concentrate on the International aspects of frequency allocations in the v.h.f.-u.h.f. part of the spectrum. With the advent of satellite beacons and translators, these frequencies can no longer be considered a national asset—they become international. The Federal Council of the W.I.A. is aware of this shift in emphasis and already much work has been done in setting down proposals for efficient use. An outline of this work appeared in the Federal Comment of July "Amateur Radio"—highly recommended reading for all Amateurs interested in the future of their service.

In 1901 H. W. Jenvy made W/T contact from Queenscliff, Victoria, to H.M.S. St. George and H.M.S. Juno over a distance of some 20 miles. Later that same year, Mr. Hallam, assisted by "Pop" Medhurst (later to become VK-7AH) in Tasmania, worked the same two British warships over distances up to 30 miles.

In 1970 Amateur stations in Geelong and Melbourne, Victoria, worked across Bass Strait to VK7WF Burnie, a distance of over 220 miles on 1296 MHz.

Thus over a period of some 70 years in the same general geographic area we have seen a remarkable increase in both the distance over which we can communicate and the frequency used for such communication.

What changes can we, therefore, expect to see take place in the next 60 to 70 years? Fortunately, no doubt, no one can be sure of what the future holds for us, but some pointers are already apparent. The integrated circuit is just starting to appear in Amateur equipment—no doubt this penetration will increase with subsequent dramatic decrease in equipment size and this may mean a growth in interest in such pursuits as fox hunts, field days, "mountain topping" and mobile operation. The s.s.b. mode of communication should expand onto the v.h.f. bands in the same way as it has spread on the h.f. bands during the last decade.

The next Australian built satellite is intended to be an active repeater. This will open up all manner of new and exciting avenues of v.h.f.-u.h.f. communication. From there, on an international scale, we may proceed to a system of Amateur satellites in synchronous orbit. Project Moonray, already more than a pipe dream in the U.S.A., offers the possibility of easy "moonbounce" contacts. Laser beam techniques may be the means of communication on even higher frequencies than are at present contemplated. No one with any imagination can say that the future does not hold in store some exciting and stimulating work for the Amateur experimenter and operator alike.

No doubt the next 60 years will see much, if not more, change in the modus operandi of Amateur Radio than has occurred in the previous 60. Let us make sure that this potential can be realised by banding together to resist attacks on our frequency allocations and other privileges—by allowing the W.I.A. to be able to say in all truth that it represents the interests of Amateurs in Australia—in 1970 and in 2030.

—D. H. RANKIN, AX3QV.
Federal Vice-President.

The History of Amateur Radio and The Wireless Institute of Australia

In the March 1970 issue of "A.R." we published the first part of what we had hoped would be a series under the heading used above. The task has proved to be a far more formidable undertaking than was anticipated. As a result of the March issue, a considerable amount of information has been forthcoming, and this has involved much reading and cross-checking. The flood of material has, whilst filling many gaps, served more to highlight the lack of information available to produce a complete and accurate story.

To illustrate the problem, since the first article was published, the first minute book of The Amateur Wireless Society of Victoria has come into our possession. Before reading any further, it is suggested that column three, page 24 of the March issue be re-read and compared with the following points extracted from the minute book, and newspaper clippings included therein.

The first minutes are of a public meeting held on 30/11/1911, to which is appended a clipping from "The Argus" of 1/12/1911, which reads:

WIRELESS TELEGRAPHY SOCIETY

"Influenced by the desire of a number of young men who are keenly interested in wireless telegraphy to meet others like-minded, Mr. P. H. M'Elroy, of Swanston Street, convened a meeting, which was held in the Esperanto-hall, Elizabeth Street, last night. There were 50 enthusiasts present, who formed themselves into the Amateur Wireless Society of Victoria. Several of the young men stated that they had installed wireless stations on a small scale at their homes.

"Office bearers were elected as follows: President, Mr. M. A. Ryan; Treasurer, Mr. P. H. M'Elroy; Committee, Messrs. Davenport, Mitchell, Roberts, Cole, Bennie and M'Laughlin. The Secretary is Mr. F. E. Moore, 39 Lisson-grove, Hawthorn."

The name of "Davenport" appears to be incorrectly spelt, not only in the press report but at various times in the minute book. It appears as Davenport, Devonport and Devenport, the last spelling would appear to be correct. At the same time, there is apparently a further error in the press as the minutes of the meeting have been amended to list a Mr. McClelland as a committee member, who was appointed Vice-President.

The only meeting listed as having been held on the premises of P. H. McElroy was a committee meeting on the 6/12/11. The first general meeting was held on 13/12/11 at Esperanto Hall, all general meetings after that date were held at Oxford Chambers.

To jump forward somewhat, we quote the following from the minute book:

"Extraordinary Council meeting of the Amateur Wireless Society of Victoria held at Mr. O'Shannessy's residence on Thursday, 10th April, 1913.

"This meeting was called for the purpose of considering the advisability of changing the name of the Society, and a motion was moved, seconded and carried unanimously as follows:

" 'That in the opinion of the Council it is expedient and in the best interests of the Society to change its name, and that it be recommended to the general meeting to be held on 1st May, 1913, that the name be altered immediately to "Wireless Institute of Victoria".' "

The minutes of the general meeting of 1st May, 1913, show that the recommendation was placed before the meeting and carried unanimously. Nowhere in the minutes is there any mention of the existence of two societies, of any disbandment of a club, or any desire to join with another club. This does not mean that some other club or society did not exist; indeed, there is some scanty evidence that another organisation did exist, but of which more evidence is required.

The lead is to be found in the minutes of the Amateur Wireless Society of Victoria, committee meeting of 19/12/11 when various designs for the Society's "crest" were discussed. Mr. Devenport submitted a design (the original drawing is pasted in the minutes) similar to that in column 2, page 24, March "A.R.," but the wording reads "The Victorian Amateur Wireless Club". The Secretary was instructed to have a zinc block prepared embracing the features of Mr. Devenport's design. Either the Secretary worked with remarkable speed or Xmas holidays were unknown (we suspect the latter) as a printer's proof of the finished block is with the minutes. The wording has been changed to "The Amateur Wireless Society of Victoria" in full, the last three words being up-side down, and not as on the medal reproduced in "A.R."

Strange to say, there is no record in the minutes of the production of this badge for the Amateur Wireless Society. The first time a badge is mentioned is in the minutes of the general meeting of the Wireless Institute of 1st June, 1913, when members were advised that in future it would be necessary to "shew" badges or cards at the door. What this badge comprised is not known, and remains a matter for conjecture.

(Continued on Page 13)

MANAGEMENT COMMITTEE, COUNCIL OF WIRELESS INSTITUTE OF AUSTRALIA
SYDNEY TOWN HALL, 1923

Back Row: 1, O. Mingay; 2, ——; 3, A. Perrit; 4, ——; 5, Basil Cooke, 6, W. P. Renahaw; 7, H. A. Stowe; 8, H. Newman; 9, ——
Front Row: 1, W. Hannam; 2, ——; 3, E. T. Fisk; 4, C. D. Maclurcan; 5, Hurst; 6, J. H. A. Pike.

From Letters to the Editor the following month of September making a correction to the the photograph caption.

PHOTOGRAPH IDENTIFIED

Editor "A.R.," Dear Sir,

It was my pleasure to receive copies of your August issue from two friends, both directing my attention to page 6. The page 6 picture was actually that of the Exhibition Committee of the (Radio) Wireless Exhibition organised under the auspices of the Wireless Institute, N.S.W. It was not the management committee of the Institute.

Those in the picture: No. 9 was Sid Colville and front row No. 2 was Mr. Hungerford, of Western Electric (now S.T.C.).

I was Treasurer of the W.I.A. (N.S.W.) at the time and suggested the Exhibition, and undertook to organise the industry to support it, which was done with success and the W.I.A. finished up with over £800 net profit, pretty good for a first effort.

During the 60 years of W.I.A. activity it has proved its worth to the nation and to thousands as a pleasurable hobby.

With best wishes for every success to A.R.

—O. Mingay.

A Highlight of Amateur History

One sunny but cool late July day I was standing on the main pier at the Port of Melbourne on Port Phillip Bay. With me were my brother and mother and father. Around us buzzed a cacophony of human voices as a great mass of people surged along the pier; some hurrying as though they knew where they were heading; others standing hesitatingly as if uncertain; but all in a mood of excitement.

Above us on both sides of the pier towered great, massive grey steel superstructures, looking more grey in the shadows and lighter where the sun filtered between the roofing above the milling people. The air was permeated with laughter and giggles, cat-calls and whistles, and typical Australian idioms as children became separated from parents, husbands from wives, and girls together, sometimes with boys, vigorously pursued their paths through the mass of people to get a better view.

Dotted all over the metal superstructures were men clad in white, some high up on the sky line and some halfway down; some leaning with chin on hands staring at the crowd below and some moving like seeming irregular white dots from one part to another. It was all very bewildering! I was only nine years of age! What I was observing was Victoria's greeting to some of the 45,000 men of the United States Fleet under the command of Admiral R. E. Coontz of the U.S. Navy. The year was 1925! Half the Fleet was at Port Melbourne and the other half in Sydney Harbour. This was history in itself because it was the first (and I believe the only time) that the Fleet of the United States of America ever visited Australia.

It was to be more than 30 years before I was awakened to the significance of my childhood memories of this great armada of ships. One of those anchored at Station Pier, Port Melbourne, was the Flagship of the Fleet—U.S.S. Seattle. On board the Seattle was an Amateur Radio operator who was in fact enacting an event which historically had such far reaching results as to be worthy of recording as one of the greatest highlights of Amateur Radio. His name was Lieutenant Fred H. Schnell, U.S.N.R.F., traffic manager of the Amateur Radio Relay League, contributor of many "firsts" in the development of Amateur Radio circuitry published in "QST" magazine and subsequently used by Amateurs all over the world, and commended for the value of his work to the United States Navy.

The U.S. Fleet was on a six months' cruise of Australia and New Zealand, ending when it finally dropped anchor at San Diego on 26th September, 1925. Lieutenant Schnell—a Navy Reservist—was in charge of short-wave communication from station NRRL on board the flagship Seattle. His assignment was to carry out tests in the use of high frequencies for the Fleet's long distance communication. In this he was so successful that on many occasions during the six months NRRL maintained regular communication at extreme distances, often being the sole contact between the Fleet and land, and daily outperforming standard naval equipment of the day using twenty times its power.

What an achievement for an Amateur station! His accomplishments earned him an official letter of appreciation from the Admiral of the Fleet commending him for his tireless labour and the effectiveness of his work, and expressing the Navy's appreciation of the importance of the readiness of the Radio Amateur organisation and its willingness to be of service in the national interest. The 1,000 messages per month of official navy traffic and over 200 per month of Amateur traffic was proof itself.

● This is not one of the series of official historical articles to be published in this magazine. It is, however, an extract from the historical files put in story form for the anniversary issue of "Amateur Radio".

The files are not yet chronologically complete although information is being received from many sources. If readers have any old magazines, books, newspaper cuttings, minute books—any old records at all—the Institute would appreciate receiving them, on loan or otherwise. They will be safely kept and returned if required.

Our history is something we should all cherish and it is already very late!

AUSTRALIAN CELEBRATIONS

The U.S. Fleet did not arrive unannounced. From the Amateur viewpoint the arrival was well advertised for many Australian Amateurs had already worked NRRL and Lieutenant Schnell was to be "feted around the town" in typical Amateur fashion. When the Seattle tied up at Station Pier, Port Melbourne, on 20th July, 1925, he was met by two Victorian Amateurs who themselves were to make history—Ross A. Hull, A3JU, and H. Kingsley Love, A3BM—who were accompanied by several other A3s.†

Kingsley Love was, at this time, editor, and Ross Hull associate editor of a magazine titled "Experimental Radio and Broadcast News", an excellent publication devoted to the practical design and construction of wireless apparatus for experimenters and including the "doings" of licensed Amateurs in Australia. It commenced publication in August 1924 and was the "Official Organ of the Wireless Institute—Victorian Division". After

† At this time the Australian prefix letter was "A". This was changed to "VK" a little later on.

THE A.R.R.L. AND THE W.I.A. JOIN HANDS
EXECUTIVE OF VICTORIAN DIVISION OF W.I.A. AND LIEUTENANT F. H. SCHNELL

Back row (left to right): E. H. Cox, A3BD, Treasurer; B. Jermyn Masters, A3LM, Hon. Secretary; Max Howden, A3BQ, Third Vice-President; R. P. Whalley, A3JZ, Second Vice-President.
From row: Lieutenant F. H. Schnell, 1MO-1XW; H. Kingsley Love, A3BM, President; Ross A. Hull, A3JU, First Vice-President.
(Reprinted from "Radio Broadcast," Sept. 1925)

six months of publication, Ross Hull became its managing editor and Kingsley Love its managing director. This arrangement prevailed until September 1925.

With the October 1925 issue the title had been shortened to "Radio Broadcast," now printed in Sydney, and known as the "Official Organ of the Wireless Institute of Australia" with Ross Hull as its sole managing editor, Kingsley Love having apparently disassociated himself from the publication. Hull, however, remained only two months before moving away from editorial work, having been made an Associate Member of the Institute of Radio Engineers (America). B. Jermyn Masters, A3LM, became secretary and editor, with a combined December 1925/January 1926 issue again printed in Melbourne. This issue was still published as the official organ of the W.I.A., but the following issue (February 1926) was not so captioned and appears to have been the last issue under the editorship of B. J. Masters. The publication also appeared to have moved away from the strictly Amateur experimenting field.

The interesting thing about the three aforementioned gentlemen was their prominence in Institute affairs at the time Lieutenant Schnell met them on Station Pier. Kingsley Love was President of the Victorian Division and Ross Hull First Vice-President. Amongst the greeting party also was Jermyn Masters who at this time was listed in one of the early call books as A3WI, Wireless Institute of Australia (Victorian Division), Ashburton. The Ashburton station was housed in a small brick building owned by the Division and had just been completed at the time of the U.S. Fleet's visit to Australia. It was later disposed of, probably for financial reasons, but received quite a deal of publicity, its picture being published in various magazines including the January 1926 issue of "QST" in which Lieutenant Schnell wrote a long and interesting report of his cruise with station NRRL, and the hospitality bestowed upon him, and other radio operators on the Seattle, by the Australian Amateurs.

Following a visit to the Little Collins Street office of "Radio Broadcast," Lieutenant Schnell reported:

> "It was a duplicate of what I saw when I first went to Hartford some five years ago (A.R.R.L. Headquarters). A little unimposing office on the fifth floor of an office building in Little Collins Street, Melbourne, the office of "Radio Broadcast" (Australian) edited by Ross A. Hull. A stenographer, bookkeeper, circulation manager and what-not seemed to be a Miss Mycroft. Another young lady in the outer office was the only other assistant. I mention this only because I hope Australian "Radio Broadcast" will prosper as did "QST" and I hope Hull will have an office as large and with as many employees as we have at A.R.R.L. Headquarters now. I have seen A.R.R.L. Headquarters grow out of a dinky little two-room office on the fifth floor of the Waverly Building. If Hull could have seen this with me, he would be encouraged as I am. Amateur Radio in Australia is bound to prosper."

Amateur Radio did prosper, but "Radio Broadcast" magazine did not. Ross Hull became editor of "Wireless Weekly" later on, the forerunner of "Radio and Hobbies," now known as "Electronics Australia".

At a later date again, he joined the staff of "QST" and eventually became its editor until his demise in 1935 by electrocution whilst experimenting with Amateur Television.

At this time in the mid 20s the visit of Lieutenant Schnell with the U.S. Fleet was, as far as Australian Amateurs were concerned, effectively a meeting with the A.R.R.L. for the first time. The present day Amateur has to realise that in these days Australia was very isolated from the progress of wireless overseas. Most of the technical information came from "QST" in America. The majority of components used by both Amateurs and manufacturers were also of American origin and were not always easily obtainable.

It was, therefore, a great day for Australians to actually meet and talk with American Amateurs and to participate in the important high frequency tests conducted by Lieutenant Schnell aboard the Seattle with station NRRL. The Victorian and New South Wales Amateurs who were privileged to share with him some of the jubilation of the success of his mission demonstrated it by giving he and his fellow crew members an official dinner that was never forgotten by those who attended. The Melbourne dinner, illustrated herein,

Gathering at the 1925 Melbourne dinner tendered to Lieutenant F. H. Schnell, of the A.R.R.L.

shows (right-front centre of those standing) Lieutenant Schnell (wearing glasses) standing next to Kingsley Love (President of the Victorian Division) and to the left behind Love is Max Howden, A3BQ (Third Vice-President). Also present was E. H. Cox, A2BD (Treasurer of the Division) and R. P. Walley, A3JZ (Second Vice-President of the Division) Another illustration shows the Executive of the Victorian Division with Leutenant F. H. Schnell, 1MO-1XW—later operating as W4CF, the call he still holds.

Whilst the Seattle was berthed in Melbourne, Schnell visited Sydney where the same exciting welcome was extended to him. His main host was Charles D. Maclurcan, A2CM, a member of the board of directors of the famous Hotel Wentworth, owned by his family, the story of which forged a link in Australia's history. Maclurcan was a skilled engineer and one of the "pioneer operators" of Amateur experimenting in Australia together with his young friend and ally, Jack Davis, A2DS, who made Amateur history at the age of 17 years. The episodes of the pioneers is the subject of another story however.

Lieutenant Schnell spoke highly of the hospitality extended to him in Sydney, as he did of the Melbourne hospitality, whilst addressing the gathering at the two official dinners given in his honour.

"COUNTRY OF COLD TOOBS"

Schnell had noted the "cool" operation of the vales in Australian transmitters compared with the "red anode" operation by American Amateurs. Ross Hull had replied to his comment on one occasion by saying, "This is the country of cold toobs". This saying stuck and throughout his stay Schnell commented on the efficiency of Australian transmitters running so "cold" compared with the American way of "crowding 4,000 volts into a lone 5-watter"

After countless Hamfests, the Seattle sailed on 6th August, 1925, on its home voyage with the Fleet. The cruise, the meeting with the A.R.R.L. traffic manager, the huge log of stations worked all over the world was the talk of Amateurs for a long time after. As the editor of "Radio Broadcast" said in the front page of the September 1925 issue:

"The visit of Lieutenant F. H. Schnell and his radio crewmen to this country of ours—the land of cold "toobs"—was described in all its detail in the daily press and it is not our intention to go over it all again. There are just a few thoughts, however, that we must express.

"It is our desire, in the first place, to record for the Amateurs of Australia, our sincerest thanks to the U.S. Navy and the American Radio Relay League for having made the trip possible. It was surely the finest bit of work they ever accomplished.

"If these two organisations could only realise the stimulus they have indirectly given to our experimenters, well, we think they would send out a fleet with a bunch of 'Hams' say once a month.

"They have given us the 'kick' we wanted. They have shown us by their profound enthusiasm, their sincerity and good fellowship, that in Amateur Radio we have a brotherhood that has no equal. They have shown us that in Amateur Radio we have the finest game in the whole wide world.

"The land of cold 'toobs' will never forget you, OMs."

Lieutenant Fred Schnell went back to managing traffic for the A.R.R.L. and conducting many more experiments for the benefit of Amateurs all over the world. In "QST" for January 1970, one could only be saddened to read the following:—

"Many readers will be distressed to learn that Fred Schnell, W4CF, formerly traffic manager of the A.R.R.L. and remembered for his many 'firsts' in Amateur Radio, including the first two-way contact across the Atlantic and the famous cruise of NRRL to Australia in 1925, proving the value of short waves to the U.S. Navy, has suffered a series of long illnesses and is now living at the Grovemont Convalescent Home, 210 West 21st Ave., Bradenton, Fla., 33505. Fred would sure appreciate cards or QSLs from his many friends."

It was men of the calibre of Lieutenand Fred Schnell who, whilst serving their country, forged the strong links of Amateur Radio around the world—links which have grown stronger with the years.

During his visit, Fred Schnell was made an Honorary Life Member of the Wireless Institute of Australia and it is confirmed that he has regularly received "Amateur Radio" magazine.

On behalf of Australian Amateurs and the W.I.A. we extend him hearty good wishes and that he has been spared to hear from his many friends. Perhaps some of the remaining VK old timers who recall the history written herein may put pen to paper and give Fred a bit of the same "kick" he gave Australian Amateurs so many years ago.

—G. Maxwell Hull, VK3ZS

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

VK5MS	316/340	VK5AB	297/314
VK6RU	314/339	VK4KS	295/310
VK3AHO	311/326	VK4FJ	287/307
VK4HR	311/330	VK4TY	284/298
VK2JZ	308/326	VK2APK	281/287
VK6MK	303/323	VK3TL	271/277

Amendments.

VK3ZE	250/253	VK3SM	192/196
VK2SG	248/250	VK4RF	175/175
VK3VK	234/234	VK2AHH	169/179
VK4DO	230/243	VK9KY	122/122
VK4UC	224/224	VK3JM	119/119
VK3AMK	218/218		

New Members:

Cert. No.	Call	Total
110	VK7JV	130/130

C.W.

VK3AHQ	301/315	VK3YL	276/282
VK2QL	300/323	VK3NC	274/300
VK4FJ	290/315	VK3XB	270/287
VK4HR	289/311	VK3ARX	270/279
VK2AGH	282/296	VK6RU	266/289
VK2APK	280/288	VK4TY	259/272

Amendments:

VK4DO	192/209	VK3SG	139/143
VK4UC	173/174	VK2AHH	131/139
VK4RF	161/173		

OPEN

VK4HR	315/340	VK6MK	304/324
VK6RU	315/340	VK2EO	302/325
VK2AGH	312/332	VK2APK	298/309
VK3VN	308/326	VK4FJ	298/323
VK4SD	306/321	VK4KS	296/315
VK4TY	306/321	VK3ARX	295/304

Amendments:

VK2SG	282/288	VK4RF	226/238
VK4UC	264/266	VK2AHH	194/206
VK4DO	247/265		

New Members:

Cert. No.	Call	Total
124	VK9KY	123/123
125	VK4JI	100/100

Wireless Institute Publications

Any attempt to produce a history of publications of the Institute from its inception is, due to lack of information at this time, a very sketchy project. There is abundant evidence that the attempts were at the best only spasmodic, and largely undertaken as Divisional projects. In the hope that somebody will help fill in the gaps in our knowledge, an attempt will now be made to outline what little information we have.

The first concern appears to have been the production of lists of "Wireless Calls", and the early lists included a number of calls other than Amateurs, mainly ship and shore stations. The first list of which we have any knowledge (indeed a copy is still in existence) was produced on 12th March, 1912, by the Wireless Institute of New South Wales. It listed 38 ship stations, 3 land stations and 32 Amateur stations. The Amateur stations were all located in New South Wales. The interest in the land stations is the DX character of two of them, namely Macquarie Island and Adelieland. The third land station listed was the South Head Signal Station.

At some subsequent period the owner of the list made a number of amendments and additions. A further 35 ship stations, 1 land station and 17 Amateur stations were added. The amendments were made to Amateur call signs, but there is no record of the period of time over which the alterations and additions were made, but from the different inks and pencils used, it must have been over a fair length of time.

For our next known reference we must move on to the 31st January, 1913, when it is recorded in the minutes of the Victorian Division Committee: "That it was decided that a list of licensed Amateurs, with calls, kindly procured by Mr. Long, was to be duplicated and sold to members at 6d. each." The minutes of the general meeting of 3rd February record: "At this meeting a list of all the licensed Amateurs of Victoria with call letters was brought forward for sale and a great many lists were sold." On 21st February: "It was decided to have duplicated 50 copies of 'supplimentary' list of licensed wireless calls." Neither of these lists are known to have survived

On 1st April, 1913, it was suggested that the authorities be asked to supply the Institute with names and addresses of licensees as licences were granted, and this was arranged with the Director of Radio Telegraphy, Mr. Balsillie, a few days later. A report on the matter can be found in "The Argus" of 4th April.

The minutes of the 27th inst. (month and year not recorded, but May 1913 can be deduced) have a badly worded minute which reads "It was decided not to print any lists of calls pending a publication of an up to date list as per resolution of International Radio Convention, in conjunction with the New South Wales Institute."

It would appear (erroneously) that the list was forthcoming very soon after as it is recorded on the 1st August "members were informed that the new book of calls issued conjointly with the N.S.W. Institute was printed and on a shew of hands the number required was taken for ordering." From subsequent minutes it would seem the "book of calls" had not been printed, but that the project was still in the discussion stage, and indeed the minutes of 12th September refer to the "forthcoming publication". A fortnight later it was "decided to leave the publication of the book of calls in the hands of Messrs. Cole and Witt."

It would appear that the project did not go smoothly as on 30th October, "The meeting was informed that the book of calls would go to print immediately upon receipt of amended list of experimenters from the P.M.G's Department." There is no further reference to the project until 7th April, 1914, when "Mr. Cole informed Council that the call book had gone to print". At the same meeting it was decided that the price to members be fixed at 2/- per copy. The minutes of the subsequent Council meeting are undated, but they record that 150 copies of the call book had been sold. The final reference we have to this publication is in the minutes of the Council meeting of 14th August, 1914, when it is recorded that the greater part of 100 book of calls were on hand and it was decided to give Coles Book Arcade and P. H. McElroy the opportunity of disposing of them.

Fortunately, copies of this call book have survived, and we list hereunder the full list of "Experimenters Calls" from the book, which was published under the title "Wireless in Australia".

EXPERIMENTERS CALLS

1914

NEW SOUTH WALES

XAA—J Y. Nelson, McMahon's Point.
XAB—A. S. Arnold, Ashfield.
XAC—V Sullivan, Smithtown.
XAD—H W. Draegar, Redfern.
XAE—S. G. Jeffes, Central Bankstown.
XAF N C. Foster, Rozelle.
XAG—Howe Choy, Sydney
XAH S. J Sainty, Sydney
XAI—L. C. Presdee, Wollongong.
XAJ J Place, Paddington.
XAM J A. Morris, Haberfield.
XAQ—C. F. Sykes, Redfern.
XAR—A. Miatt, North Botany
XAS—H. A. Stowe, Drummoyne.
XAV—C. R. Pilgrim, Hurlstone Park.
XAY—A. Y. Cameron, Arncliffe.
XAZ—R. Evans, Paddington.
XBB—J M. Sandy, Burwood.
XBD—P Crook, Coff's Harbour Jetty.
XBE—T. S. Martin, Sydney.
XBH—H. O. McCormack, Neutral Bay
XBM—C. P. Bartholomew, Mosman.
XBO—W. Hudson, Dulwich Hill.
XBP—E. W Bonwill, Sydney.
XBR—A. W. Rost, Waverley.
XBV—G. Field, Arncliffe.
XBW—G. S. Gow, Burwood.
XBX—R. Lewington, Chatswood.
XBZ—J Cole, Wollstonecraft.
XCA—R. C. Allsop, Randwick.
XCC—C. S. Crouch, Randwick.
XCE—R. E. Shute, Strathfield
XCF G. R. Gannon, Artarmon.
XCG—C. A. Gorman, Oatley
XCI—S. J Bowicke, Paddington
XCJ Cox and Stanner, Lindfield.
XCL—T. R. Willmot, Toongabbie.
XCN—W C. R. Snellgrove, Willoughby.
XCO—C. M. Coughlan, Concord.
XCP—M C. Perry, Randwick
XCT C. S. Tiley, North Sydney
XCV—Wm Pollard, North Sydney.
XCX—R. Akercyd, Ashfield.
XCY—A. Binns, Mosman
XDA—T. W. W Burgess, Wagga Wagga.
XDC—L. M. J. Butler, Singleton.
XDD—W. F. Butler, Dulwich Hill
XDG—M R. Shelley, Henley
XDM—Maciurcan and Lane, Sydney.
XDN—A. M. Phillips, Marrickville.
XDQ—J McNamara, Sydney
XDR—A. H. Elliott, Drummoyne.
XDT—F Lawless, Enmore
XDW—Royal Sydney Yacht Squadron, Milson's Point.
XDY—J H. A Pike, Arncliffe
XEB—W E. Bidmead, Marrickville.
XED—Lieut. J. S. Nolan, Double Bay
XEH—A. V. Cape, Granfell.
XEM—E. Moore, Petersham
XEN—F Leverrier, Waverley.
XEQ—W E Hilton, St. Leonards.
XER—J. J. Stewart, Redfern.
XEU—N A. Holmes, Manly.
XEZ—C. Tripp, Campbelltown
XFA—R. E. McIntosh, Pymble
XFE—J Jeramy, Wagga Wagga
XFJ—C. Jackson, Mosman.
XFM—F J Brooks. Arncliffe
XFN—Gunner Clarke, Ashfield
XFP—W P Renshaw, Roseville.
XFQ—N H. Wright, Mosman
XFR—V J. Brain, Ashfield.
XFT—A. Borland, Burwood.
XFU—K. Stanton, Ashfield
XFX—Wm. Hughes, Jn , Rozelle.
XFY—G. Williams, Annandale.
XGE—L Lane, North Sydney.
XGG—F. G. H Wilkinson, Ashfield.
XGH—C. C. Hamilton, Woollahra.
XGJ—H. L. Peck, North Sydney
XGP—S B. Godwin, North Sydney.
XGQ—H. A. Warden, Narrabri.
XGR—H Harris, North Sydney
XGV—G. S. Thomas, Paddington
XGY F Y Tyrer Toongabbie.
XHB—H Brewer, Bondi.
XHD—H. W Devlin, Manly.
XHG—L. Smith, Waverley
XHH—H. Hawker, Grafton.
XHJ—D. H. McBurney, Milson's Point.
XHL—H. Leverrier, Sydney
XHO—E. K Burke, Lindfield
XHV—A. F Vipan, Petersham.
XHW—E. Stewart, Glebe Point.
XHY—H. V Masters, Stanmore.
XHZ—A L. Spring, Waverley
XIA—H. Wilkinson, Drummoyne.
XIB—C. J. Frazer, Granville.
XIC—J A. Hutchison, Granville.
XIF—J A. Eagles, Jiggi.
XIG—W Baird, Hurstville.
XIH—A. Blyard, Nowra
XII—N B. Charlton, Pymble
XIJ—R. I. Fletcher, Woollahra.
XIK—G A. Uther Sydney
XIL—C. Olsson, Balmain.
XIN—W G. Shellhear, Walla.
XIP—E. J Lynch, Campbelltown
XIQ—E. G. Lampard, Parramatta.
XIR—W McMenamey, Milson's Point.
XIT—J G. Peake, Summer Hill
XIW—R K. White, Bowral.
XIX—P. L. Grimwood, Germanton.
XIZ—R. Vowles, Burwood.
XAAD—A. Clark, Rockdale.
XAAF—N E. D'Arcy, Pymble.
XAAL—W Hinton, Wagga Wagga
XAAN W Blackwell, Camperdown.
XAAR—M N Chapman, Springwood.
XAAU—R. F Hill, Waverley
XAAY J C. A. Roberts, Parramatta.
XAAZ—F W Kimpton, Grafton.
XABD—A. V Costelow, Dorrigo.
XABM -W Thorncroft, Rookwood
XABO—E. McPherson, Grafton

XABQ—W. Zech, Annandale.
XABR—E. A. Bruce, Artarmon.
XABS—C McDonell, Ashfield.
XABU—H. Knight, Newtown.
XABY—N E. Husband, North Sydney.
XACA—G. U H. Taylor, Glebe Point.
XACC—R. Monty, Surry Hills.
XACF—H. E. Simpson, Randwick.
XACI—Rev Father O'Reilly, Bathurst.
XACJ—R. P. Whitburn, Leichhardt.
XACK—The Smith Premier Business College, Sydney.
XACQ—K. Fremlin, Newtown.
XACU H. K. Bannister, Pymble.
XACW—E. Turner, Jnr., Mosman.
XACX—G. P. Junk, Sans Souci.
XACY—E. Robinson, Marrickville.
XACZ—H. Curtis, Bondi.
XADA—W. L. Gall, Paddington.
XADC—G. C. Hook, Kogarah.
XADD—H. Way, Sydney
XADE—G. Pickering, Waverley.
XADF—C. S. Mackay, Coff's Harbour Jetty.
XADK—Wireless Institute of New South Wales, Sydney
XADL—A. R. Butler, Belmore.
XADN—J C. Humphries, Muswellbrook.
XADW—F B. Cooke, Sydney.
XADX—P W. Darch, Croydon.
XADY—E. G. Crichton, Waverley.
XADZ—C. B. Burchell, Summer Hill.
XAEA—J G. Watt, Croydon.
XAEB—A. Smith, Canterbury.
XAEC—C. Rowe, Burwood.
XAED—A. Gregory, Bellevue Hill.
XAEE—H. S. Maxwell, Paddington.
XAEF—A. Volkerts, Leichhardt.
XAEG—H. Tuson, North Coast.
XAEH—Amalgamated Wireless (Australasia) Ltd., Sydney.
XAEI—E. Gardiner, Haberfield.
XAEJ—B. Makin, West Kogarah.
XAEK—A. B. Cochrane, Longueville.
XAEL—P. G. Stephens, Balmain.

VICTORIA

XJA—C. Deutgen, Camberwell.
XJB—L. A. Fontaine, Prahran.
XJC—G. S. A. Gaylard, Canterbury.
XJD—J. L. Matthews, Richmond.
XJE—A. E. Pell, Malvern.
XJF—H. V. Heinecke, Brighton.
XJG—A. G. Frazer, Camberwell.
XJH—V Barnes, East Brunswick.
XJI—F. W. D. Gowers, Seymour.
XJJ—R. Bryson, Richmond.
XJK—W Fisher, Middle Park.
XJL—E. H. Brasch, Hawksburn.
XJM—R. Payne, Armadale.
XJN—C Ham, Melbourne.
XJO—W. R. Armstrong, St. Kilda.
XJP—H D. Billings, Brighton Beach.
XJQ—W T Appleton, Malvern.
XJR—F. J. W. Derham, Malvern.
XJS—J Stickland, Hawthorn.
XJT—T. Pickford, Malvern.
XJU—W. V Nicholls, Korumburra.
XJW—C. W. Jamieson, St. Kilda.
XJX—B. J. Mullett, Upper Pakenham.
XKA—G. F Lloyd, Brunswick.
XKB—E. L. Reynoldson, Strathmerton.
XKC—R. S. Wilson, East Malvern.
XKD—C. F. Cooper, East Melbourne.
XKG—D. Hodges, Essendon.
XKI—W. J Miller, Croxton.
XKJ—L. Osburne, Terang.
XKK—V. Nightingall, Elwood.
XKN—E. Hasselbach, Surrey Hills.
XKW—W. K. Witt, St. Kilda.
XKZ—C. E. Holland, South Yarra.
XLA—W Aitken, Jnr., Elsternwick.
XLB—R. M Dalton, Auburn.
XLC—A. Horbury, Bendigo.
XLD—C. Hlam, Jnr., Balaclava.
XLF—R. B. Ashe, Middle Brighton.
XLG—T J Entwisle, Camperdown.
XLK—A. R. Goode, Moonee Ponds.
XLL—O. Rheuben, South Melbourne.
XLM R. Irwin, Canterbury
XLN R. Rees, Canterbury.
XLO—C. W Donne, St Kilda.
XLP—A. A. C. Miller, St. Kilda.
XLX—H. W Maddick, Elsternwick.
XMB—R. H Owen, West Melbourne.
XMC—F. G. McClelland, East Melbourne.
XMI J Saban, Auburn.
XMJ J. K. Twycross, Abbotsford
XML—E. B. Parker, East St. Kilda.
XMO—C. Whitelaw, Rosedale.
XMQ—H. C. Trumble, Middle Brighton.
XMS—W. Bishop, Queenscliff
XMT H. E. Dangerfield, Malvern.
XMU—M Israel, St. Kilda.
XMV—C. C. H. Ellis, Auburn.
XMW—R. W Allen, Beulah Rail.
XNE—E. F. W. Goodwin, Essendon.
XNF—A. M. Wright, Brighton.
XNH—W. S. Tregear, Kensington.
XNJ—N A. James, Homebush.
XNM—A. E. Pritchard, Moonee Ponds.
XNO—J. Boyd, Jnr., Elsternwick.
XNQ—A. Wellman, Kensington.
XNT—C. Hazard, Brighton.
XNU—J. R. McConnell, Canterbury.
XNV—M. L. Robertson, South Yarra.
XNX—R. Horne, Kensington.
XNY—T. Court, Jnr., Malvern.
XOA—H. J. Wales, Elsternwick.
XOE—H. H. Blackman, East Malvern.
XOF—W. H. Bruce, East Malvern.
XOG—G. A. Soilleux, Camberwell.
XOI—C. S. Pugh, Preston.
XOL—V. Way, West Brunswick.
XOO—L. Birchall, Richmond.
XOQ—R. Chugg, South Yarra.
XOR—C. Reay, Middle Brighton.
XOS—R. P. Bruce, Flemington.
XOT—J M. L. Crombie, Malvern.
XOU—C. Taylor, West Melbourne.
XOZ—C. H. Swanton, Kew
XPA—G. H. Myers, Elsternwick.
XPB—R. L. George, Mont Albert.
XPD—C. C. Bailey, Malvern.
XPF—Jas. H Wilken, Kilsyth.
XPG—A. H. Wain, South Yarra.
XPH—A. Holst, Caulfield.
XPI—Jas. McNair, [illegible] West.
XPJ—Wireless Institute of Victoria, Melbourne.
XPL—O. E. Rawson, Richmond.
XPO—H. J. Taylor, Warracknabeal.
XPP—W. Ming, Melbourne.
XPR—G. Flanagan, Ascot Vale.
XPS—W. C H. Hodges, [illegible]
XPU—H. C. de Crespigny, Middle Brighton.
XPV—L. L. Dredge, South Preston.
XPW H. S. Kennedy, Coburg.
XPZ—S. Newman, Canterbury.
XJAA—C. G. B. Colquhoun, South Yarra.
XJAB—C. M. Urquhart, Albert Park.
XJAC—B. C L. Harvey, Port Melbourne.
XJAD—C J. Brown, Melbourne (Ch. of E. Grammar School).
XJAF—C. R. Smith, Caulfield.
XJAH—G. H. Silliman, Brighton.
XJAJ—A. Crook, Castlemaine North.
XJAK—J Rafferty, Hawthorn.
XJAL—A. Mott, [illegible] Ponds.
XJAM—H. A. Stewart, Williamstown.
XJAQ—R. M. Firminger, North Melbourne.
XJAS—N. Harrison, Hawthorn.
XJAT—R. W. McKellar, Toorak.
XJAU—F. Topping, Croxton.
XJAV—T P. Gibbon, Kew
XJAX—F. P O'Dea, Ascot Vale.
XJAZ—C McCracken, Armadale.
XJBA—W Jameson, Albert Park.
XJBD—E C. Nicoll, St. Kilda.
XJBF—J H. R. Butler, Brighton Beach.
XJBH—W D. Brookes, South Yarra.
XJBI—A. Brown, Abbotsford.
XJBM—L. Latham, East Camberwell.
XJBN—E. Scott, Elsternwick.
XJBP—C. A. Smith, Middle Brighton.
XJBU—H. Thompson, Albert Park.
XJBY—J Mathieson, St. Kilda.
XJCA—E. G. Holder, Hawthorn.
XJCB—L. Smith, East Malvern.
XJCC—G. H Henley, Clayton.
XJCD—J. C. F Burrows, Kew.
XJCG—L. Roche, Hawthorn.
XJCL—J. B. Arnold, Moonee Ponds.
XJCM—W. E. Sanson, Warrnambool.
XJCN—W. K. Davenport, St. Kilda.
XJCO—C. R. Dodson, Fairfield.
XJCP—R. Mitchell, Royal Park.
XJCS—J. Matthews, Sunshine.
XJCT—V. Myers, Melbourne.
XJCU—A. B. Corkill, Moonee Ponds.
XJCV—R. Field, Kew
XJCW—J. Welch, Murrumbeena.
XJCX—C. Bannister, Brighton.
XJCY—C. Semmens, East St. Kilda.
XJCZ—H. E. Taylor, Camberwell South.
XJDA—C. Forshaw, Elwood.
XJDB—K. Francis, Coburg.
XJDC—C. T. B. Knell, Windsor
XJDD—H. M. Shannon, Brunswick.
XJDE—I. Hughes, Kew
XJDF—Captain William Clarkson, Toorak.
XJDG—J. A. Campbell, Toorak.
XJDH—E. G. Offen, Middle Park.
XJDI—A. Stocks, Surrey Hills.
XJDJ—F. G. Cathcart, Canterbury.
XJDK—T. Cummins, East St. Kilda.
XJDL—A. McKay, Hawthorn.
XJDM—J Pitchett, Balwyn.
XJDN—F. S. Barnett, North Williamstown.
XJDO—A. C. Smith, Matlock.
XJDP—G. Robb, Croxton.
XJDQ—C. Crowther, Canterbury.
XJDR—W. L. Leunig, Jnr., Sale.
XJDS—A. H. Morris, Sale.
XJDT—G. K. Allen, Coburg.
XJDU—C. S. C. Hughes, East Melbourne.
XJDV—T A. Crerar, Hexham.
XJDX—G. Strutt, Elwood.
XJDY—L. A. Adamson, Melbourne (Wesley College)
XJDZ—S. G. Robinson, South Yarra.
XJEA—A. McGregor, Armadale.
XJEB—J Hesketh, Kew.
XJEC—B. Coutts, Camberwell.
XJED—H. MacKinolty, Korumburra.
XJEE—A. P. Scott, East Malvern.
XJEF—D. Fitzgerald, Collingwood.
XJEG—H. A. Gatfield, South Yarra.
XJEH—E. Drake, Camberwell.
XJEI—E. Robinson, Caulfield.
XJEJ—E. Mustard, North Fitzroy
XJEK—J H. Beyer, Armadale.
XJEL—T G. Foord, Gardiner.

QUEENSLAND

XQA—M. J. G. Brims, Mareeba.
XQB—L. Freeman, Rockhampton.
XQC—R. H Berry, Rockhampton.
XQD—H. A. Shepherd, Rockhampton.
XQF—S. V Colville, South Brisbane.
XQG—G H. Gibson, Brisbane
XQH—H. B. Rockwell, Wynnum
XQI—W. H. Hannam, Stamford.
XQJ—A. G. Bamfield, Corfield.
XQK—C Wicks, South Brisbane.

SOUTH AUSTRALIA

XVB—L. Jones, Hawthorn.
XVC—V. Alderman, Glenelg.
XVD—A. H H. Evans, Mile End.
XVE—J. J. McLaughlan, Semaphore.
XVF—O. W Judd, North Norwood.
XVG—C. E. Ames, Torrensville.
XVH—S. F. Howe, Exeter
XVI—L. P Anderson, Largs Bay
XVJ—C. M Reid, Hyde Park.
XVK—P. Stapleton, Mt. Gambier.
XVN—E. R. Stanton, Enfield.
XVO—N C. McClelland, Franklin Harbour
XVP—W Magain, Edwardstown.
XVQ—I. Banyer, North Adelaide.
XVR—A Longstaff, Alberton.
XVS—A. A. Cotton, Glanville.
XVT—C. J Othen, Glanville.
XVV—A. G. Waterhouse, North Adelaide.
XVX—H. Clark, Kent Town.
XVY—A. H. Bailey, Unley.

WESTERN AUSTRALIA

XYB—J. S. Fitzmaurice, Perth.
XYD—F. Kennedy, Perth.
XYE—A. E. Dewar, Kalgoorlie.
XYK—W. E. Coxon, Maylands.
XYN—F. C. Read, Perth.
XYR—H. G. H Irving, West Perth
XYV—W. B. Garner, Perth.
XYX—A. Sibly, North Perth.
XYAE—S. C. Ambler, West Perth.
XYAF—T. W. Sampson, Boulder
XYAG—W. E. Mill, Burbanks.
XYAH—W. E. Collins, Cannington.

TASMANIA

XZA—A. G Dixon, Wynyard.
XZB—E. Kirby, Hobart.
XZC—M. Harvey, Hobart.
XZD—F. N Medhurst, Sandy Bay.
XZE—R. James, via Hobart.
XZH—W. P Hellim, Hobart.
XZJ—V. Batchler, Hobart.
XZO—W. O. Duffy, Hobart.
XZP—R. S. Dawson, Hobart.
XZQ—H. D. Mansfield, Burnie.

It is recorded that the cost of a full-page advertisement was £2 and full pages were taken by The Lawrence & Hanson Electrical Co. Ltd., Maclurcan & Lane, Marconi-Telefunken Schools of Radiotelegraphy, and Warburton Franki Melb. Ltd.

During the early 1920's recourse must be made to various commercial publications for details of Amateur and Experimental Calls. Many of these magazines have survived and make interesting reading. An interesting list appeared in the "Illustrated Tasmanian Mail" of 7th February, 1924, which list includes those licensed for both receiving and transmitting. This list, which was forwarded by Lon Jensen, VK7LJ, was accompanied by a letter from Lon which reads in part: "If I remember correctly, licences at about 1923 were issued for crystal or valve receivers and I think that is the reason for the letters 'C' or 'V' against the names towards the end of the list. I do not know the source of the list published in the 'Illustrated Tasmanian Mail' on 7th Feb., 1924, but it seems suspect in some instances. For example, both Len Crooks (VK7BQ) and Bob O'May (VK-7OM), I think, had a receiving licence

before me—yet they are shown towards the end of the list."

Lon's comment is equally applicable to other lists still in existence and errors and discrepancies between lists of nearly identical dates have been noted. Lon also sent a copy of a list of Tasmanian transmitters as in 1927 and states "the source of this list is not known but it seems correct." Perhaps here we can add to Lon's knowledge a little.

We have a printed notice of the general meeting of the W.I.A., N.S.W. Division, for 16th February, 1927, which includes the following. "Tasmanian Division has published a complete book of Australian Call Signs; price 1/-. N.S.W. members could obtain a copy by forwarding a postal note for 1/4, which sum included postage."

An interesting publication appeared late in 1924, when the "Sydney Evening News" published their Wireless Handbook. To detail the full contents of its 128 pages is beyond the scope of these notes, sufficient to say it appears to cover most aspects of wireless at the time. Our main interest in it at this time is the fact that it lists The Amateur Transmitting Stations of Australia The definition of "Amateur" must have been somewhat elastic at the time as the list includes 13 call signs allocated to commercial organisations. Again the list must be a little suspect as there exist discrepancies with other lists published about the same time.

The writer knows of no other call books produced until after the war, when the P.M.G's Department published such a book before the Institute negotiated for the rights to the publication in 1954

The idea of an Institute magazine does not appear to have been discussed until the 14th July, 1914, when it is recorded: "An interesting suggestion for the advancement of the Institute was put forward by an applicant for membership, Mr. H. Maddick, and was favourably received by a majority of members present. The suggestion was to the effect that a newspaper be published at intervals to be decided upon by the Institute. Mr. Maddick offered his services as Hon. Editor, and told of promises he had received from various people of matters for publication. After some discussion it was decided to leave the matter of making enquiries into the details of the scheme and expenditure connected therewith to Mr. Maddick, a report to be furnished at the next general meeting."

There is no mention in the subsequent minutes of the fate of the proposal, but no doubt the fact that the war in Europe commenced early in August had something to do with the failure of the project to become a reality. It is strange there is no reference to the matter being abandoned or even discussed at the next general meeting, although a report was to be submitted

Perhaps there is somebody somewhere who can carry on from this point

—K. E. Pincott.

The History of Amateur Radio and the W.I.A.

(Continued from Page 6)

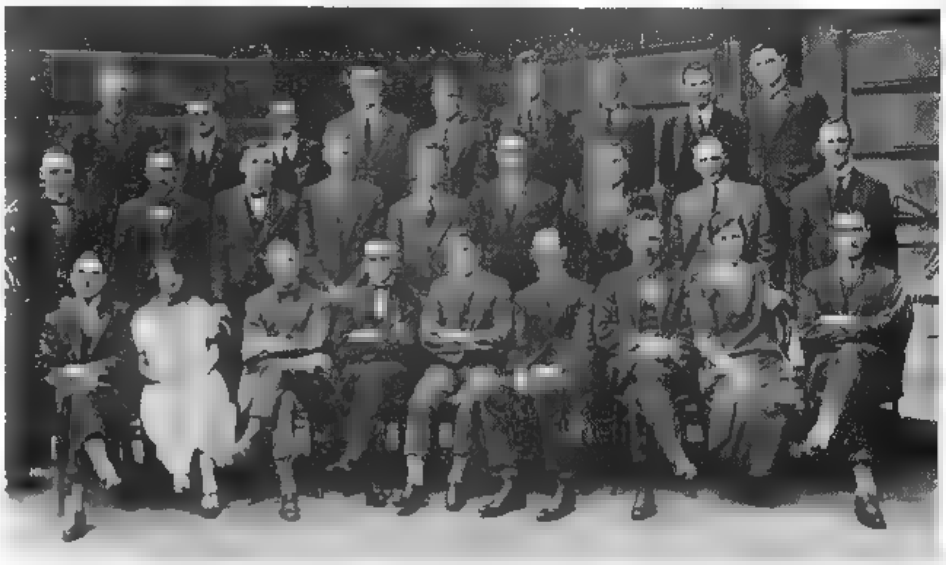
From the records it would appear that without any preliminary discussion, the general meeting of 1st August, 1913, was asked to forward to the Secretary "designs for a new badge". The minutes of the subsequent Council meeting are un-dated, but they appear to be some time during the same month, when it is recorded that there was some discussion on the new badge. The badge is next mentioned in the Council minutes of 12th September, 1913, where it is recorded: "The business of the meeting was chiefly dealing with . . . and the adoption of badge design for stamping."

There are no details of the design until the general meeting of 1st October, when the minutes record: "A design for a badge was voted for and the design selected was of distinctive appearance with a streak of lightning flashing through a cut-out section of the metal. The name, Wireless Institute of Victoria completes the design." (See page 24, March "A.R.") The outcome was that the Council at their meeting on 15th October decided "that 50 medals should be purchased at the rate of £5/10/0 for 50, and that the selling price to members be fixed at 3/- each." Very little time must have been lost on this project, as the minutes of the Annual General Meeting, held on the 20th October, 1913 (possibly the most extensive in the book) record: "At the close of the meeting . . . and the Hon. Treasurer sold several badges at 3/- each."

In concluding these brief notes, I wish it to be clearly understood that I am in no way critising the material provided by Mr. Hull, indeed I hope to see much more from him What I do hope is that the importance of gathering every available piece of written material and making it available to the Federal Historian is realised. **Should you have any such material you wish to retain, I make a plea that you will at least make it available for photo-copying for the official records.**

I would also wish to echo the plea made by the Federal Historian several years ago that secretaries take more care in the preparation of their minutes, and include more detail. Going through our old minute book, it is realised that much important material (as far as history is concerned) is omitted, and there is now little or no hope of it being traced

—K. E. Pincott.



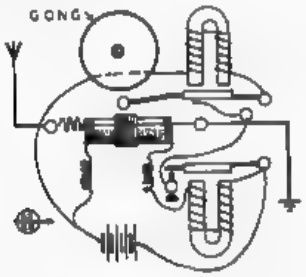
GROUP OF REPRESENTATIVES AT WIRELESS AND ELECTRICAL EXHIBITION, SYDNEY TOWN HALL, DEC 1923

An Outline of Early Radio

1860-1895—FOUNDATIONS LAID FOR ELECTRO-MAGNETIC WAVE COMMUNICATION

Without the pioneer work of the early experimenters and physicists there would be no Amateur Radio, at least as we know it, so we must make a start with them. This dissertation will in no way take the place of the Historical Development of Radio Communication by J. R. Cox, VK6NJ, in "A.R." Dec. 1964-June 1965, or the History of the Institute that Max Hull, VK3ZS, is compiling. There must be some duplication but it will be as little as possible and only in order to keep this outline as coherent as my ability allows.

Things must start with Maxwell, who theorised that electromagnetic waves were possible. Then came Hertz, who in his investigations on induction produced and detected them. Other people added their contribution and one of the products of this was the Branley Coherer which consisted of a glass tube loosely filled with filings which presented a high resistance to the passage of d.c. until placed in the field of Hertzian waves when the particles would cohere and offer a low resistance, allowing current to flow. When the waves ceased, the tube had to be shaken in order for the particles to separate and attain their high resistance once again.



POPOV'S CIRCUIT FOR DETECTING LIGHTNING AT A DISTANCE.

HERTZIAN WAVE COMMUNICATION ESTABLISHED

It was at this stage when the two independent people developed almost identical receivers for electromagnetic wave detection. On one side of the continent A. S. Popov made the simple coherer a more sensitive device and automatically restored it by using an electric bell to signal whenever a wave passed through the coherer and on its return stroke the tapper gave the coherer a nudge, separating the particles so that they would instantly be ready for the next wave.

This apparatus, illustrated in diagramatic form in this text, was demonstrated at a meeting of the St. Petersburg Physical Society on 7th May, 1895. It was designed to record lightning discharges at a distance and was connected to a lightning conductor and earth and would register atmospheric discharges at distances of up to 20 miles. It was described in the Society's journal as a lightning recorder and was in fact connected to a Siemens Morse telegraphic tape recorder when in use.

Popov did not think of it for communication at this stage as he thought that the spark coil with which he tested it would have to be far more powerful or else that a sufficiently strong source of oscillations must be discovered for this to be of much use.

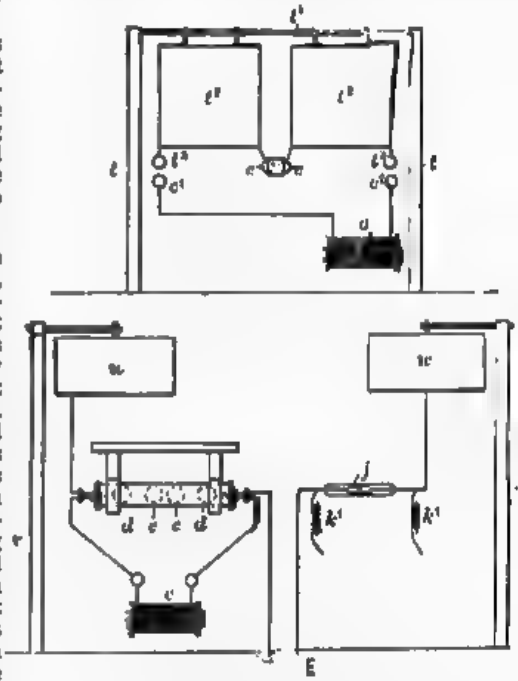
It was not until Marconi and his patent application became known that Popov started thinking about communication again and then did do some good work including a self restoring coherer using microphonic contacts and a telephone receiver to receive the oscillations and with this was able to conduct some marine rescue work.

Marconi, who really started the whole communication by means of wireless, was an extremely careful and meticulous worker with the vision to see what he required. First he took Branly's coherer and instead of the great clumsy tube he used a small bore tube and put in two small silver plugs about a mm. apart with filings between them and evacuated the tube. By using filings of 95% nickel plus 5% of silver filings ground as fine as dust, he made an extremely sensitive detector. He improved on this even more by making the plugs with bevelled faces instead of square and by lashing the unit to a small holder of bone, he could adjust the amount of filings between the faces of the gap by rotating the coherer in the lashings so that the space to be filled by the filings was slightly greater or less as was required for the maximum sensitivity.

He also discovered that a maximum of one mA. must be the limit through the coherer. The diagram shows this type. For de-cohering, he used a gentle tapper operated by a relay and supplied with a great many adjustments so that the required de-cohering movement only was made and there were not any sparks to operate the device unnecessarily. Finally, the thing that set this apart as a communicating instrument more than anything else was the fact that Marconi used aerial and earth systems on both the transmitter and the receiver. Popov, of course, had used an aerial (lightning rod) and earth on the receiver, but not attached them to his spark coil so that its radius of transmission was pitifully short.

It was with apparatus such as Marconi's that the Australian experimenters worked the warships "St. George" and "Juno", escorting the Duke and Duchess of Cornwall and York in S.S. "Ophir" in April 1901. More detail of this and photos of equipment used will follow under a separate heading.

The upper left drawing on the cover of this issue shows the apparatus used by Marconi in his British demonstrations and formed the basis of his application for a patent. The first for wireless telegraphy, of which part of the drawings are shown in the text. This was Pat. No. 12,039 of 2nd June, 1896, and bore the title "Improvements in Transmitting Electrical Impulses and Signals and in Apparatus therefore"

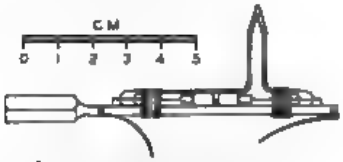


Marconi's first patent drawings.

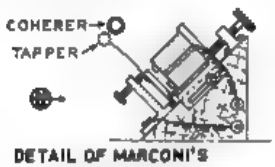
Marconi set to work on increasing the distance and reliability of wireless and invented and improved gear to a great extent. His Transatlantic experiments proved a great success in showing what the theorists thought impossible; in fact, that signals could be transmitted around the world. There was some dissention in the fact that they were not recorded by ink tape like the usual practice, but this was due to the fact that he was using an Italian Navy self-restoring coherer and an earphone for this series of tests. The Castelli coherer used iron plugs with a clean drop of mercury between them in a 3 mm. internal diam. glass tube.

The two next important things were the introduction of tuning coils, Pat. No. 7777 of 26th April, 1900, and the invention of the magnetic recorder. This last (top centre of cover) became the standard detector up until about 1910, although they were still used after that date. It worked on the principle of hysterisis in iron due to a changing magnetic field. Primarily the instrument consists of a band of stranded

soft iron wire moving by a clockwork drive around two pulleys. In moving, the wire passes through two coils concentrically wound and placed close to two permanent magnets. The aerial and earth, or a tuner coil, is connected to one coil and a pair of earphones (low resistance) to the other. Any wireless signal or train of pulses changes the hysterisis curve of the moving wire and induces a signal in the phones. In actual fact, the detector was supplied with a duplicate set of coils and magnets on the rear side of the unit and could be connected to the same tuner or another and two frequencies could be copied on the one machine.



MARCONI COHERER Mounted on bone holder.



DETAIL OF MARCONI'S DE-COHERING DEVICE

Different experimenters had different views on the polarity of the magnets. If like poles were together the set-up resulted in a slight hissing or breathing sound when the band was moving. If the magnets were re-arranged so that the band met a N pole then two S poles, with the remaining N pole well clear of the coil, then the hissing sound was absent and the detector not quite so sensitive. Some experimenters liked the breathing sound which showed that the gear was working, while others thought that the sound masked signals. There was not much to choose and it came to personal preference. Commercial units of this type were built having a built-in tuner and some were made in England for the express purpose of receiving time signals radiated from the Eiffel Tower each hour.

ENTRY OF THERMIONICS

Possibly the next significant events were the development of the diode and triode. The diagrams in this text are taken from patent papers of the period and show the respective dates and Patent No's. Controversy still rages on whether De Forest inserted a grid in Flemming's diode or independently developed it from first principles, and I will not enter into that one here. Sufficient to say, that the diode was used with existing tuners as were crystal detectors which were found also to have directional conducting properties.

The sets using the diode were supplied with two diodes so that when the filament went in one, the other one could be switched in with very little lost time As they were rather fragile units and not more efficient than the magnetic detector, they did not get a great deal of use. As they were fitted with a bayonet base for the filament, crystal detectors were made that could be plugged in when no more valves were available and the set would remain working.

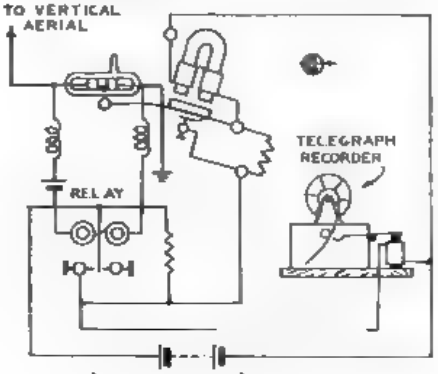
As far as the triode was concerned, it did not get much use outside of a few American experimenters and suffered the same trouble with short life cathodes. In actual fact, they were built with two filaments so the tube could still be used when one burnt out.

The triode as a detector was only slightly more efficient than the electrolytic type and about the same as a crystal. Up to 1910 there were only about 200 to 300 a year turned out, indicating that crystal and other means were preferable to an expensive short-lived device. It was not until 1912 that it was found that it could be used as an amplifier, but its μ was very low. Valves of any description didn't really get off the ground until the war years when tremendous strides were made and numbers of valves were produced.

Below the magnetic detector and shown on circuit A is a loose coupler crystal receiver that had a lot of use in various forms, both pre- and post-WW1. It was used for a tuner and fed a number of different detectors, including valves. Owing to the great variety of taps available the device covered an extremely wide frequency range. The circuit B was a simple crystal set, but added to it was a buzzer which was operated while finding the most sensitive point of the cat's whisker on the crystal and thus determined that the set was working and at its best.

C was the Marconi wide range tuner used in conjunction with all types of detectors. A double pole switch was used for either general listening or searching and then thrown to the other position for fine tuning and maximum selectivity. Range 1, 80-150 metres; K1, K2 and K3 had additional fixed C placed in series with each, and P1 set on a low tapping. Range 2, 150-1600 metres, circuit as shown. Range 3, 1600-2000 metres, fixed parallel C added to K2 and K3 and tap towards centre of P1. Range 4, 2000-2600 metres, more parallel C added to K2 and K3, maximum tap on P1.

D is a spark coil and ball gap transmitter producing highly damped waves of a rough nature. Often they sounded like atmospherics when detected on a crystal set. This is similar to the later ones used by Marconi and were used as emergency marine transmitters until the early thirties.



MARCONI'S RECEIVING CIRCUIT

E is a later spark transmitter and many Amateurs in this country used something very similar. This is virtually the same as the transmitter on the top right of the cover. It operated from 110v. a.c. lines and the synchronous motor rotated the wheel gap The wheel had a series of studs and each stud would just reach the discharger as the a.c. reached its peak value and produced a musical note depending on the frequency of the power supply The fixed stud had air-cooled fins mounted on it because it operated for every discharge, while the rotating studs conducted only once per revolution, giving them time to cool. The cover transmitter also has a quenched spark gap which could be used and was really efficient and gave a musical note. Like all these transmitters, they were very broad and could be heard a long way either side of their fundamental.

POST WORLD WAR I. YEARS

While there were spark transmitters used post-WW1, valves became plentiful in receiving types, but relatively scarce in power transmitting types; not that this stopped the resourceful Amateur. Incidentally, there did come on the disposals market small spark outfits that were definitely obsolete as far as the Defence Department was concerned. Originally built for aircraft, they were not particularly comforting to use with their vicious spark amongst the petrol vapour which seemed to emanate from everywhere in the aircraft.

Circuit F was a c.w. transmitter using a triode valve. Most transmitters were virtually the same. Some had many valves in parallel to provide sufficient power. For large valves and power, high tension was supplied by motor generator instead of battery banks. This was the only way to get sufficiently high d.c.; rectifiers for converting a.c. voltages were not a going thing then.

The first start made in this direction was an electrolytic rectifier and many were the directions given in the popular papers for making them; messy and all that they were. Later came the dry plate rectifiers and also mercury vapour tubes.

THE C.W. RECEPTION PROBLEM

The c.w. transmitter produced keyed continuous waves (many people today think c.w. is synonymous with Morse Code) and crystal sets had trouble receiving this mode as a rule, so i.c.w. was produced by inserting a chopper wheel at point X in the grid circuit. Occasionally they were placed in the plate supply, but this was then required to handle larger currents and voltages. The chopper was an insulated wheel with brass segments on the periphery. When mounted on the shaft of the m.g. set, it used two brushes touching the segments and intermittently closing the grid circuit, thus producing a note in simple receivers (interrupted continuous waves)

Another method was modulated continuous waves (m.c.w.) and was simply produced by feeding raw a.c. of 200 to 1,000 cycles on the plate. Until very recently some marine l.f. transmitters still used this method, particularly on

their emergency transmitters, although then often they modulated the grid via a small audio oscillator.

Circuit G was a tikker type receiver for receiving keyed c.w. Two types, one using a wheel not unlike a chopper and with a crystal in series with it, and the other (illustrated) used a slipping contact on a metal disc. Both had a small battery motor to drive them (and how they prevented picking up their own armature noise I will never know). With the disc, while disc and the contact had low resistance, the condenser across the phones started to charge in the presence of a signal and as the contact slipped the condenser would discharge through the phones. The make, slip, make, would make the signal audible, but owing to the random nature of the set up, it gave rather a poor note.

Circuit H was the next answer in that a heterodyne was made between a local oscillator and the incoming signal. Before a valve was used in this situation, a special earphone with a second coil fed from a tiny high frequency alternator, whose speed could be varied, gave the required beat note.

MORE EFFICIENT RECEIVERS

Circuit I made the most use possible from an expensive valve. It is an early reflex model which is first a tuned r.f. amp. feeding a crystal set detector whose output was transformer coupled back to the grid of the valve which then amplified the audio signal and passed it to the phones.

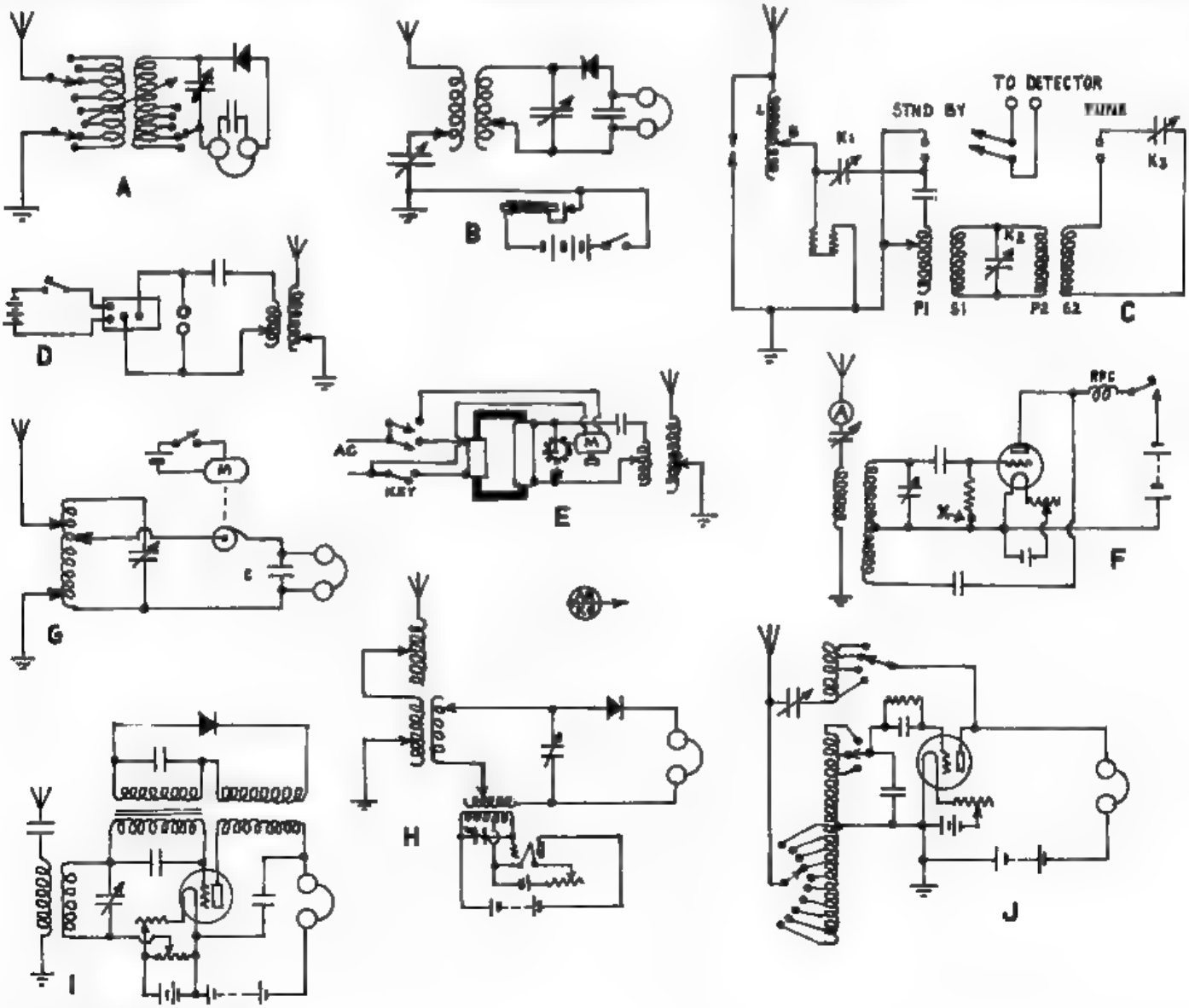
J is the circuit of the famous Reinartz receiver, a regenerative set devised about 10 years after Armstrong first developed a feedback receiver. This, with its spider-web coils was possibly the most efficient of its type. The cover receiver on the left, under Marconi's, is a similar type but with a couple of audio stages following it. These could have the output taken from each stage, the respective jack automatically removing the potential from the following valve when the phones were plugged in.

To the right of this receiver is a typical high power rig of the early 1920s which put out quite a reasonable signal. It is interesting to note that these transmitters, partly because of their method of supplying h.t., each had an individual sound by which they could be identified. Radio items of 1924 mention that so and so had a locust note (if locusts buzz), such and such had a semi-liquid note, while others had a liquid note. One had a liquid note, almost like water, but bubbly, and "plomps" up and down. Notes like ducks quacking (early s.s.b.?) and not very stable. Rough notes were also mentioned.

As these were all master oscillator types, when the rig was keyed, the h.t. tended to drop, so frequency was not too stable. One method to overcome this was to introduce more h.t. into the line when it was keyed. Sometimes this consisted of a resistance which was shorted out by an auxiliary contact. Others used an auxiliary transformer with a small winding in series with the main transformer that was only energised under key-down conditions. In fact all sorts of dodges were used to keep those volts steady.

BROADCASTING ERA

Between 1920 and 1930 were the years of broadcasting and experimenting, and everyone had to have a share of some



No. 879,532 PATENTED FEB 18, 1908

L. DE FOREST
SPACE TELEGRAPHY
APPLICATION FILED JARN 1907

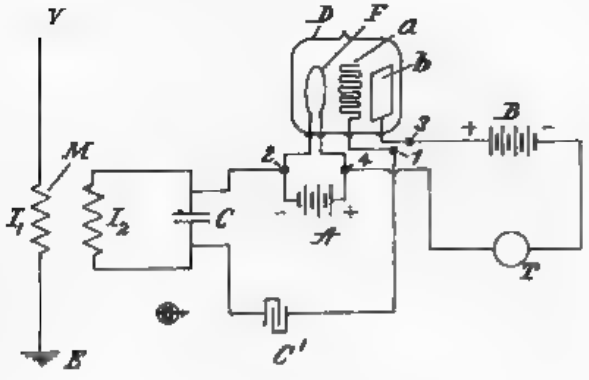
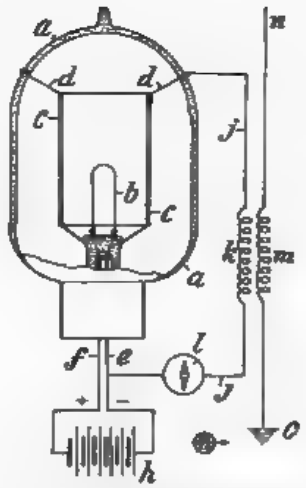


Fig. 1

PART OF PAGE ONE OF DE. FOREST'S PAT. DRAWING



J.A.FLEMING'S THERMIONIC VALVE
PAT. Nº 24,850 NOV 16 1904.

Philips »Miniwatt« Triode A 306

FILAMENT VOLTAGE . . v_f = 2.7–3.3 VOLTS
FILAMENT CURRENT . . i_f = abt. 0.06 AMPÈRE
PLATE VOLTAGE . . . v_a = 20–100 VOLTS
SATURATION CURRENT . i_s = 10 MILLIAMPÈRES
AMPLIFICATION FACTOR μ = 6

GENERAL

The Philips „Miniwatt" triode A 306 is a *high vacuum receiving valve*, specially designed for use as a *L. F. amplifier*, but it may also be used as a *detector*. It is designed to be worked from 3 *cells of 1.5 volts in series*, in this case a filament rheostat of *at least 30 ohms* should be connected in series with the filament. This triode having an exceptionally low filament current (abt. 0.06 A) the battery is very slowly discharged.

The employment of too high a filament voltage, will shorten the life of the valve and may destroy its emitting power.

A filament voltage higher than is absolutely necessary for good results, should be strictly avoided and the filament rheostat kept inserted as far as possible.

One should not attempt to judge the proper adjustment of the resistance by the relative incandescense of the filament.

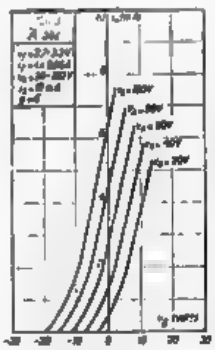
Some results can be obtained with our type A 106, only one single cell of 1.5 volts being necessary.

DETECTOR

When this triode is used as a *detector*, the grid should be connected to the positive side of the filament by means of a grid leak resistance of 0.3 to 3 megohms (0.3 to 3 millions of ohms) or better still between the grid and the slider contact of a potentiometer, shunted across the filament. An anode voltage of 20 to 40 volts will be sufficient to procure satisfactory results.

Important! Do not overcharge the filament!
Protect your valves by using Philips filament safety fuse.

Above and below: Examples of early valve data sheets issued with each valve purchased.



v_f = filament voltage
i_f = filament current
v_a = plate voltage
v_g = grid voltage
i_s = saturation current
μ = amplification factor

AMPLIFIER

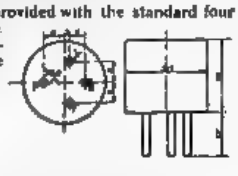
The action of this valve is *sufficiently powerful* to work *a loud-speaker of small size* and at the same time ensure *amplification without distortion*. Though it is not possible to prescribe any definite rules, we would recommend the use of this valve as the third in a three-valve set, and in a four-valve set the employment of these triodes as third and fourth valves. In a low frequency amplifier they should be placed as first and second valves. The use of a suitable grid bias is an absolute necessity, for adequate functioning this should be of

3–4½ volts at an anode voltage of 60 volts.
4½– 6 volts at an anode voltage of 80 volts.
6–9 volts at an anode voltage of 100 volts.

The positive side of the grid-bias battery used in this case should be connected to the *negative* side of the filament.

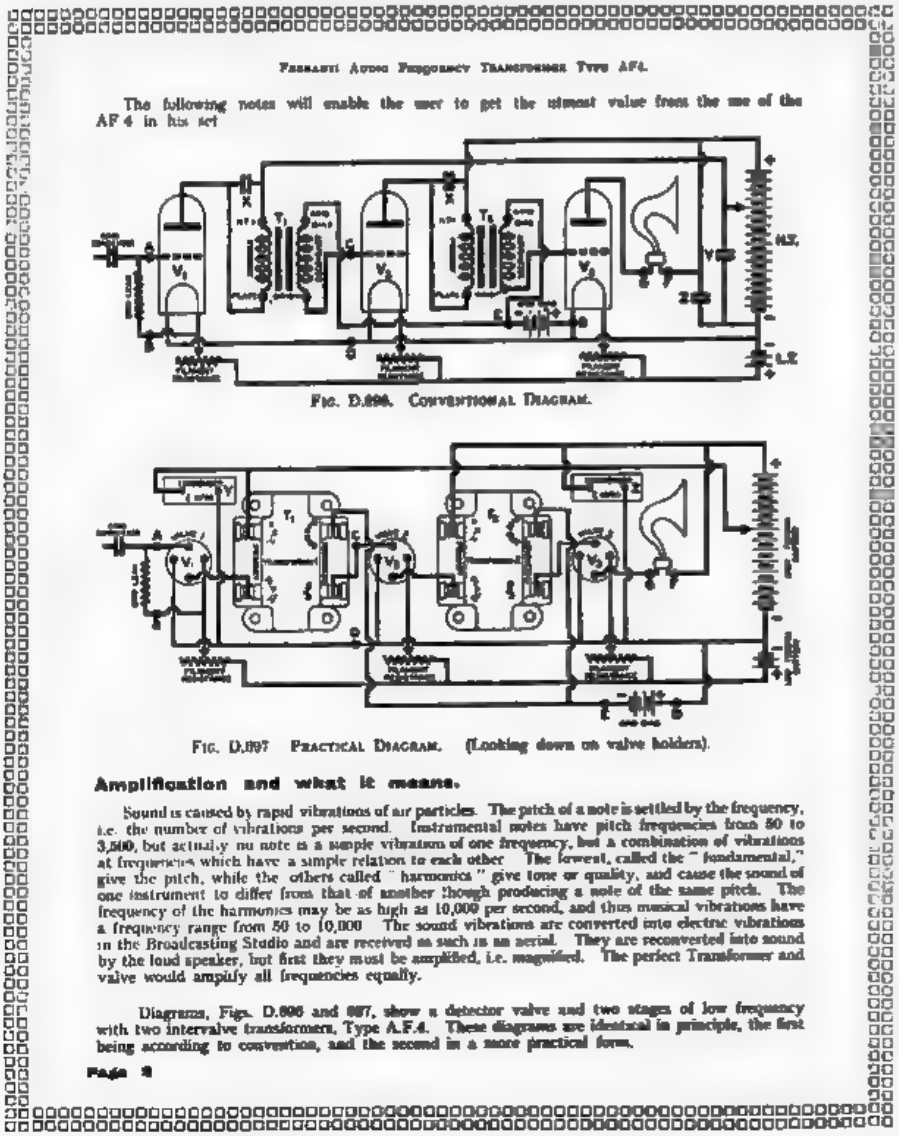
The properties of this triode are demonstrated in the characteristic curves shown here.

The triode A 306 is provided with the standard four pin Philips cap (type A 32). It can be supplied on application with any of the other usual caps.



G = grid contact pin
F = filament contact pin
P = plate contact pin

This valve has been carefully tested before leaving the factory.



Philips' Audio Frequency Transformer Type AF4.

The following notes will enable the user to get the utmost value from the use of the AF 4 in his set

Fig. D.896. Conventional Diagram.

Fig. D.897 Practical Diagram. (Looking down on valve holders).

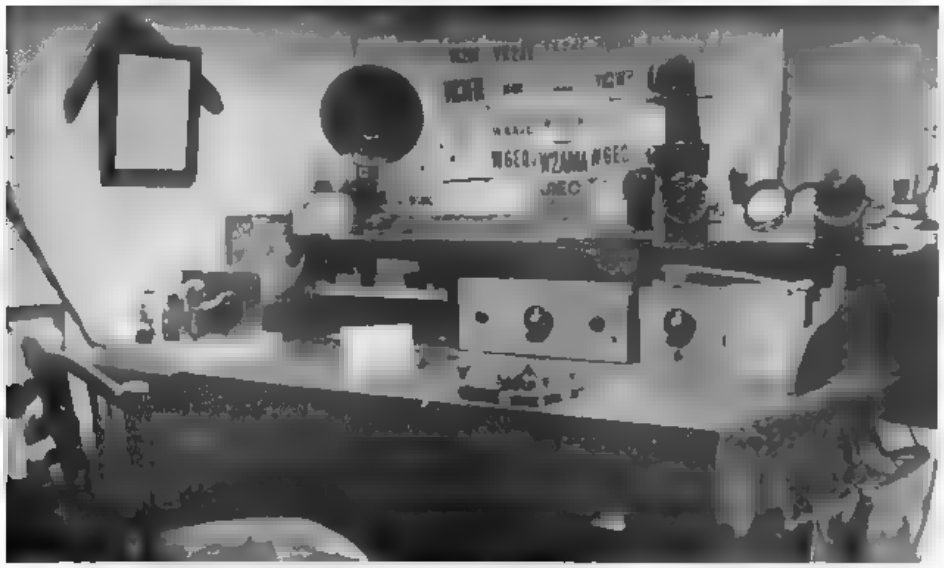
Amplification and what it means.

Sound is caused by rapid vibrations of air particles. The pitch of a note is settled by the frequency, i.e. the number of vibrations per second. Instrumental notes have pitch frequencies from 50 to 3,500, but actually no note is a simple vibration of one frequency, but a combination of vibrations at frequencies which have a simple relation to each other. The lowest, called the "fundamental," give the pitch, while the others called "harmonics" give tone or quality, and cause the sound of one instrument to differ from that of another though producing a note of the same pitch. The frequency of the harmonics may be as high as 10,000 per second, and thus musical vibrations have a frequency range from 50 to 10,000. The sound vibrations are converted into electric vibrations in the Broadcasting Studio and are received as such in an aerial. They are reconverted into sound by the loud speaker, but first they must be amplified, i.e. magnified. The perfect Transformer and valve would amplify all frequencies equally.

Diagrams, Figs. D.896 and 897, show a detector valve and two stages of low frequency with two intervalve transformers, Type A.F.4. These diagrams are identical in principle, the first being according to convention, and the second in a more practical form.

Page 3

Data sheet issued with each transformer purchased in the early days.



VK3EM's shack in the 30's.

kind. Apart from the technical publications like "Wireless Weekly" and the British "Wireless World," every newspaper ran at least a weekly page on wireless doings with circuits, photos and advertisements from all the firms you can possibly name, including some most unlikely ones. It was at this stage when there were two different types of people, experimenters and amateurs. The former were licensed, while the latter were not and mostly built receivers, though there was the occasional pirate even then.

The greatest complaint from both broadcast listeners (mostly amateurs, although by this time a lot of professional and commercial receivers were available) and experimenters was the re-radiation of the regenerative detectors used in their oscillating condition and the QRM was so bad that many bands could not be worked and many a concert or record evening was spoilt entirely by the heterodynes whistling all over the place. Letters to the press and journals of the day had a lot to say about it and while the experimenters got a lot of undue blame, the concensus of opinion was that it was the amateurs who did not know how to operate their receivers properly. The P.M.G. did state on all licences of the time that receivers must not be used in an oscillating condition

Some people pressed for the enforcement of a regulation that all sets should have an isolating stage, but did not get very far because it was hard to prevent these from "taking off". At this time the superhet was taking hold in U.S.A. and U.K., but in the Australian "Experimental Radio and Broadcast News" an article was written saying that they had no future(!). So much for early thoughts, prophets have been confounded many times

BETWEEN MID 20's AND 30's

The pattern for the next ten years settled for most licensed Amateurs as a t.r.f. receiver and a m.o.p.a. transmitter, and all the while experimenting with aerials, DX and reaching higher and higher frequencies. A few of the forward ones tried superhet receivers. Crystal control was also the thing of this period, and made for stable signals. Most blokes ground their own crystals and even made their own holders. Those who were interested in lapidary also found and cut their own quartz, but they were few and obviously dedicated.

Going back to the heydays of the 20s, phone operation also came of age and most phone operators also played music and had live recitals. The "Listener In", while publishing the programmes of "A" class (National) and "B" class (Commercial) stations, also carried the programmes of Sunday Experimental stations. Amongst these were: 3BY Caulfield, 249.9 metres, 50 watts; 3CR, East Richmond, 219 metres, 9 watts; 3EF Elwood, 241.8 metres, 15 watts; 3TM Glenferrie (wavelength and power unlisted); 3RI, Melbourne, 230.6 metres, 10 watts; 5WS Adelaide, 245.8 metres, 10 watts.

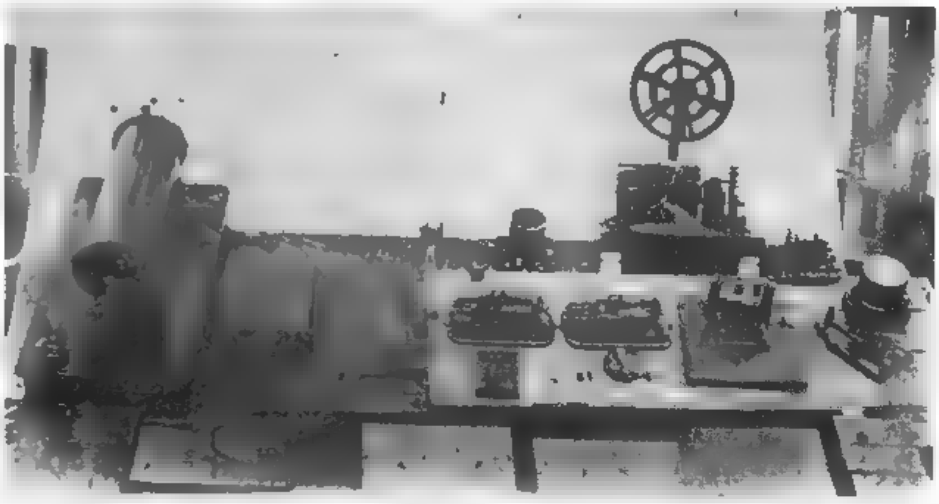
Another feature of this era was that whenever a valve or transformer, etc., was purchased, there was supplied with it full details of its connections, application and usually a circuit or two in which it could be used. A reduced facsimile of the Philips A306 is shown in this text. Radiotron did something similar, also including a circuit. The page showing circuits of an audio transformer is one of four pages of data accompanying the said transformer. Frequency response and frequencies of piano and voices were also illustrated. How hard it is these days to get information on any product!

Passing into the thirties, the photo of VK3EM's shack is typical of the period. The transmitter was a 171 crystal oscillator and a 210 p.a. to a series tuned Zepp on 7 MHz., which worked plenty of DX. The receiver was a t.r.f. —a 22 as r.f. amp., B415 regen det., and a B406 audio. The box at the left hand end was a Loften-White audio amp. which served for reproducing records or whatever (hi-fi, yet!). The shielded heterodyne wavemeter used a UX199. Alongside the Morse key is a home constructed semi-auto key which helped the c.w. immensely.

The lower left hand picture on the cover will be recognised by many While the Americans used these prior to WW2, we did not see much of them until they came on the disposals market post-war. The wartime design was generally much the same as this one, whose tube line up was 6D6 1st r.f., 6D6 2nd r.f., 6C6 1st det., 6C6 h.f. osc., 6D6 1st i.f., 6D6 2nd i.f., 6B7 diode, 2nd det., a.v.c., 1st audio, and a 42 2nd audio. A 6C6 was the c.w. oscillator. There was a crystal filter with phasing control which could be switched in or out.

The final cover instrument is one of the latest in transceivers. Amateur Radio is quite sophisticated these days and looks, feels and operates like something out of this world; particularly for those who grew up with the more primitive gear. This one is typical of many, being single sideband, selectable as to which, and making use of semiconductors and valves as appropriate to produce some 200 watts p.e.p.

(Continued on Page 19)



F W. ("Pop") Medhurst's early equipment.

RADIO DOCTORING IN THE 20's

A. J. C. THOMPSON, VK4AT*

"A.R." recently took our thoughts back to the early days of Radio. It reminded me of the conditions existing in the outback when radio first brought joy to a musically starved population. Having been presented with a home-brew radio of about 20 knobs, sundry bits and pieces, and also about a year's supply of past Wireless Weeklies, it was not surprising that I was soon up to my neck in this new pastime.

When the first "Wireless's" arrived together with their voracious appetites for batteries, it was to me that their owners turned when trouble descended upon them. These mighty monsters were always operated at full throttle. The social-standing of the proud owners were thus portrayed to all and sundry whose QTHs happened to be within a half mile or so of these sets.

Terminals were preferred to solder in these times, so this loud braying soon shook a few loose. In such circumstances the sudden silence, with its social implications, was regarded by the once proud owner as a national disaster. When the heart-breaking news was conveyed to me it was regarded as a case of extreme urgency. Off I would go armed with all the necessary tools—a screwdriver, a pair of pliers, a pair of earphones, a general purpose valve and two wet fingers to test the B battery. Arrived there, I would apply the screwdriver with diligence and off would come the sundry bits necessary to expose the "innards". There would be a gasp of astonishment at this stage, but when I carried those precious "innards" over to the table there would just about be heart-failure all around in case I tripped.

My elevation to the position of Radio Doctor (Buckshee) was made possible by having physics, maths, chemistry and kindred suitable subjects consistently rammed down my reluctant neck for some years. I knew much more about Radio 40 years ago than I do now.

Of interest perhaps is the fact that at one stage my pride and joy was the 5th edition of the A.R.R.L. Handbook. My next (to get my "ticket") was the 39th edition dated 1962. In spite of all the mental arithmetic that this sparks off, I can assure all that I have not yet reached the "Poor Old Dad, he's had it" stage.

But to revert to the "good old days"—although not exactly the "horse and buggy" days, it didn't take much rain to put the "Tin Lizzies" (then prevalent) in the shed and then it was back to the GGs once more. On one occasion I left the old Model T at home and set off to alleviate the grief on a distant cattle station. Their particular "pride and joy", with much trembling and sundry squeaks, had become obviously defunct, thus putting quite a dint in their social standing. I rode a quiet old stockhorse, taking the old cattle dog along too, just for company. On the station property itself I had to pass very close to the temporary camp of an old contract laborer. I paused for the customary few words as he prepared both his tea and also the salt leg of mutton. This latter was to be boiled during the night for his breakfast.

Now, at that period of so-called civilisation thermostats and time switches were unknown but these backward inhabitants had a very good substitute for them. Both the high and the low in the social scale all had one thing in common. That was the "Galley". This consisted of two forked sticks set in the ground. These supported a pole across them adorned with many sizes of fencing wire hooks. These were used to keep a kerosene tin of water at any desired height above the fire. Permanent residents had this contraption enclosed on three sides with the addition of a low sloping roof. The advantage of this "Galley" was that, with good judgment in the selection of suitable logs, this arrangement would heat, cook and probably cool the salt meat in the water without any further attention. Best of all there was no wood chopping required. In the present case the old chap would drop the meat in the tin and fish it out cooked at breakfast time.

I continued on to the homestead in ample time for the evening meal, and the fixing of the "Wireless". All the radio stations had to close down before a belated supper was served. This was standard procedure. It would be necessary otherwise to use a tyre lever to prise the owner off his knobs once he got his hands on them. Consequently, it was after midnight before I whistled up my reluctant dog and settled myself comfortably in the saddle for a "snooze" on the long journey home.

On this occasion the old horse played me false. He was thirsty. He turned off the road and went to a dam. Being sleepy, I didn't notice which side he turned off on. In addition, as the tracks from the dam led off in all directions, I couldn't even find the track back to the road. This was serious as, if daylight came and I was still lost in the station's horse paddock, then I would never hear the end of it. Fortunately, the old dog signalled his distress well back on what I knew would be my back-track so I lost no time in locating him. I dismounted to see what the trouble was and discovered that he was trying to carry the camper's half-cooked leg of mutton by the cool bone end. His reluctance to follow me from the house was due to his guard duty after the theft, as he waited for a chance to get his teeth into the hot part. I sat down on a convenient log, with the disputed meat in my possession, to think things over.

This was what I got for being good hearted and fixing a man's wireless set. True, I was no longer lost, but this was worse. The sight of the old gentleman's leg of mutton being carried around by my dog was no great surprise to me. He'd learned the art of abstracting meat out of hot water in a very hard school when still a pup. He had practiced his art at my QTH too. I had acquired him from a nearby cattle station. The family there consisted of many boys, each of which owned one or more dogs. As they only "killed" once a week, this tribe of dogs lived luxuriously for the first couple of days, but had a hard life for the remainder of it. This situation was relieved at times by the dispatch of a younger member of the household to the wallaby trap for much needed supplies. The "Boss" had decreed that only cooked meat of this nature could be used to alleviate the distress in the dog colony.

Soon the old kerosene tins full of water and good cheer for the hounds would be on the fire. From then on, the while tribe of dogs would sit in a circle round the fire, every nose pointed expectantly toward the tins. It was a grand sight to see! The old dog occupied the best seat downward where the aroma was sweetest. The more favoured of his harem were allowed sniffs too. I used to wonder why the lesser members of the tribe were not tailed off downwind too, but each time they tried it the aroma of the old dog spoiled everything.

When the wind shifted it was nice to see the look of bliss suddenly appearing on the face of a minor dog. The unhappy old dog would then punish the dog on his right and take his place, hopefully raising his nose with keen sniffs. In the course of a couple of hours the water level would fall and the fire be reduced to coals. The circle of dogs would gradually come closer to the tins, with the excitement rising with each inward move. Finally the old dog would attempt to guard the tins and punish the more venturesome at the same time. This manoeuvre always ended with a lesser dog dashing in, seizing a protruding part and pulling it out. Then the real brawl was on. The successful ones that got their teeth into the hot meat made more noise than those just being punished. This was the standard signal at the house that the "brew" was ready. If nobody was home, then the ensuing free-for-all could be heard for hours and for miles.

I realised, however, that brooding over the prowess of my dog in abstracting hot meat wasn't mending the situation. I knew that when breakfast came I would be suspect No. 1. According to my reckoning I had three courses open to me:—

(1) I could accept the suspicion, ignore everything, and go home.

(2) Be honest and tell the sufferer.

(3) Sneak the mutton back in to the tin.

* Skyrings Creek, Pomona, Qld., 4568.

The drawback to No. 1 proposition was that it would be necessary to separate the old dog from his meat and keep him quiet all the time as he suffered this indignity. This I could do by carrying the meat myself, but it was very likely that the old chap would have discovered his loss by this time and be awake. I felt sure that I would be very uncomfortable if I had his hot mutton hidden in my shirt and at the same time had to listen to his moans over the loss of it.

No 2 had its drawbacks too. Rousing the old gentleman up at 1 a.m. to tell him that my dog had just eaten his breakfast was a course that didn't appeal to me at all.

No. 3, the last alternative, had some merit. It depended for success on the present conditions of the meat and my ability to return it undetected.

A trip back to the dam, a few matches and a sharp knife soon returned the meat to an "as was" condition, but it definitely had lost some of its lustre. Getting it back into the tin was now a problem. Sneaking up on foot to do the job wouldn't get any co-operation from a disappointed dog. I could also ride closely past, pause a moment and drop it in. But if I missed and it fell in the dirt, then I would have to dismount to get it before the old dog.

Under the circumstances the old chap would be sure to poke his head out to see why I had stopped. Standing by his empty tin holding the cold end of his leg of mutton would not give me that air of aplomb and assurance that I felt would be necessary if I was to put up a convincing tale about putting it back—not pinching it. I could just imagine the old chap telling the tale "Such a well-known young lad too. You'd think butter wouldn't melt in his mouth, yet he must have been eyeing me bit of mutton off all the time. And what a weak excuse he give, too, when I copped him." "Just putting it back," says he.

"He wouldn't put it back after his dog had dragged it all round the paddock—or would he?"

I had to consider his feelings too. It was one thing to lie in bed at 2 a.m. gloating over a spicy tale, but it would be quite a different thing at breakfast time. As he hacked off a few hunks to go with his damper and treacle, his thoughts would go like this: "Fancy that young scalawag nearly pinching me good mutton. Said his dog dragged it round the paddock—Now I come to look closely that bit looks quite ragged —could be overcooked though looks like a bit of grass on that edge—but it could have blown in the tin with the wind."

He would vote for a few mouthfuls of damper while he thought things out. Later on he would convince himself that the mutton was edible The repeat performance would go like this. He would advance on the discarded meat with a determined step and an observant eye and mutter to himself: "Must be getting soft in the head to be put off me meat by the tale of that kid. Now just where are the teeth marks in it? That is where I just stuck my fork in it and those holes are where the fork went in when I lifted it out—or did I lift it out as usual by the bone end? Now are those fork holes or fang holes?"

Even at dinner time those questions would still not be answered. Was he to eat good meat or the dog's feed? Even after all these years I still wonder if I did the right thing that night. Nobody could possibly blame me for giving up radio for over 30 years after it had led me into such a scrape.

For the benefit of the younger readers let me take a look and see how much of this belongs to the "Fairytale" class. Actually "getting lost" belonged to a different time. The theft of the mutton did occur, but it was in the daytime. The dog belonged to the tribe which was accurately described at one of their feeding periods. The sufferers were road-workers on an outback road, and I do hope that the two gentlemen who ate that mutton are not readers of this magazine.

☆

AMATEUR FREQUENCIES:

USE THEM OR LOSE THEM!

Draft Revision of Specification for Electronic Sound and Vision Equipment

The Standards Association of Australia is seeking comment on a draft revision of Australian Standard C159-1959 Ap., S.A.A. Approval and Test specification for electronic sound and vision equipment, issued for public review as Doc. 1562.

Doc. 1562 incorporates technical advances which have occurred in the electronics industry, particularly in television receivers. It establishes essential requirements and minimum safety standards for the purpose of preventing injury to persons and/or damage to property by electronic equipment and materials used for the reception of radio and television broadcasts or for the amplifying, recording and reproducing of sound and vision.

The draft is to become one of the series of "approval and test" specifications issued under Part II. of the S.A.A. Wiring Rules, which contain conditions which must be met to secure approval for the sale and use of electrical equipment in Australia.

Copies of Docs. 1562 may be obtained, without charge, from the various offices of the Standards Association of Australia in all capital cities and Newcastle.

Comment on the provisions of the draft is invited from persons and organisations experienced in the field of electronics, and such comment should reach the head office of the Association, 80 Arthur St., North Sydney, N.S.W., 2060, or any branch office, not later than 31st August, 1970.

An Outline of Early Radio

(Continued from Page 17)

POST SCRIPT: AUSTRALIAN COMMUNICATION WITH ROYALTY 1901

Now as a post mortem, I must return to the pioneers. Until the W.I.A. was formed, and he then joined, F. W. ("Pop") Medhurst was one of our early experimenters who had the old spark call of XFM, but in 1914 was listed as XZD.

Max Hull's history relates how the Victorian team worked the 1901 Royal Tour warships, so I will mention the equipment used by the Tasmanian team of Messrs. W. P. Hallam and F. W. Medhurst, W.T engineers for the P.M.G. Department. This was similar to that used in Victoria, and is shown removed from its location and re-assembled especially for the photograph, which was originally printed on blue-print paper (used in drawing offices in the past for making copies of traced drawings).

The station was constructed at One Tree Point at the Long Beach light known as "Blinking Billie" where operating was continuous and very highly commended by the officers concerned. The equipment consisted of two spark coil transmitters of 12" and 14" respectively, with adjustable brass balls spark gaps and tuned with a tapped inductance, power being derived from Plante accumulator.

The receiver was a coherer detector with nickel and iron filings in glass tube with two silver disc electrodes, one in either end. These detectors were also duplicated so that the filings could be replaced as required, for in use oxidisation was rapid, necessitating frequent changing.

For decohering, an electric bell was used as a rapper in one case while the other was mounted on the armature of a sounder relay which operated a Siemens Morse recorder. Testing coherers for activity was done with a miniature Whimshurst machine whose spark discharge was registered on an active coherer by placing its spark gap close to the receiver aerial. The aerial was vertical end fed using a plate immersed in the river as an earth. Ninety feet of scaffold poles lashed together were erected as a support pole.

The set up was operated from a low roofed room normally used for oil storage and much concern was felt about making it presentable when the visitors expressed a desire to see this so wonderful land station.

Ken Gillespie, VK3GK.

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CONTEST CALENDAR

15th/16th August Remembrance Day Contest.
3rd/4th October: VK-ZL-Oceania DX Contest (phone).
10th/11th October. VK-ZL-Oceania DX Contest (c w)
10th/11th October R.S.G.B. 28 MHz. Phone Contest.
24th/25th October: R.S.G.B. 7 MHz. DX Contest (c w)
7th/8th November R.S.G.B. 7 MHz DX Contest (phone)
14th/15th November R.S.G.B. 1.8 MHz. Contest.
5th Dec., 1970, to 11th Jan., 1971. Ross A. Hull V.h.f. Memorial Contest.
13th/14th Feb., 1971: John Moyle Memorial National Field Day Contest.

—D. H. Rankin, F.E.

LOW-COST CO-AXIAL RELAY CONSTRUCTION

C. K. MAUDE,* VK3ZCK

Relays of the type to be described have been used by the author up to 450 MHz. and by other Amateurs up to 1300 MHz. with no noticeable loss in transmitted power.

The isolation between the moving contact and the unused contact is better than 40 dB. at two metres.

The design shown does not incorporate a solenoid activator as a suitable commercial unit does not seem to be available on the local market, and therefore I have left that portion to the constructors' own ideas. The solenoids used by the author are disposals ones re-wound to 12 volts and modified so that the activating arm moves the plunger.

The drawings shown give details for all the co-axial connectors in common use in Australia. Details are given for the following: SO239, BNC, Belling Lee, Type N and Type C.

The impedance of these relays can be made to suit either 50, 60 or 75 ohm co-axial cable. Although for normal usages, a relay of 60 ohms will give an acceptable match to both 50 and 75 ohm systems.

MATERIALS

Aluminium bar, 1" x 1", 3" long.

Phosphor bronze strip, 0.015" thick, and about 3" long.

A small piece of silver about 1/16" thick (a pre 1950 "zac" will do).

A piece of 16 s.w.g. aluminium and 1½" of polystyrene rod (a plastic knitting needle will do).

A supply of 6 BA screws and three co-axial connectors.

CONSTRUCTION

Mark out and drill the aluminium bar to suit the connectors to be used. Then drill a 8 mm. (5/16") hole through the centre of the aluminium bar, and a 5 mm. (3/16") through one pair of sides as shown in the drawing. See Figs 1, 3A, 3B, and 3C.

LEAF

The moving leaf is made from 0.015" thick phosphor bronze strip, 2-1/8" long. The width is dependent on the impedance required. For 50 ohms, cut to 0.258" in width; 60 ohms, 0.232"; and 75 ohms, 0.182"

The contacts are made from two pieces of silver, 3/16" diameter, and are soldered on one end of the bronze strip, filed smooth and polished. The fixed end of the leaf is soldered to the end connector so that the silver contacts are square on to the side connectors. (See Figs. 2A and 2B.)

The contacts on the side connectors are made of silver and are of the same size as the ones on the leaf, and are soldered to the connectors so that the total distance from the back of the mounting plate to the contact side of the silver button is 13/32", the contact is filed round and flat and then polished. (See Fig. 4.)

Note.—When using Belling Lee connectors be sure to re-inforce the central pin with a pea size bead of Araldite, otherwise the central pin has the habit of moving. (See Fig. 5.)

When all other holes are drilled, drill four holes in the end "B" and in the aluminium plate and assemble the relay placing the aluminium plate on end "B" as a cover.

REFERENCES

R.S.G.B. Bulletin, June 1965.
U.K.W. Berichte, March 1963.
R.S.G.B. V.h.f./U.h.f. Manual.

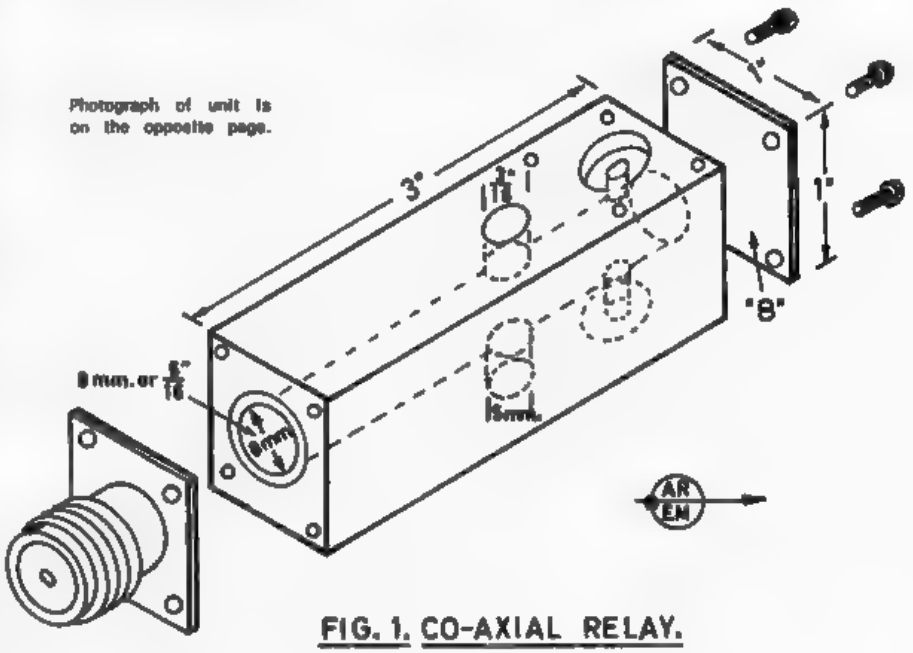


FIG. 1. CO-AXIAL RELAY.

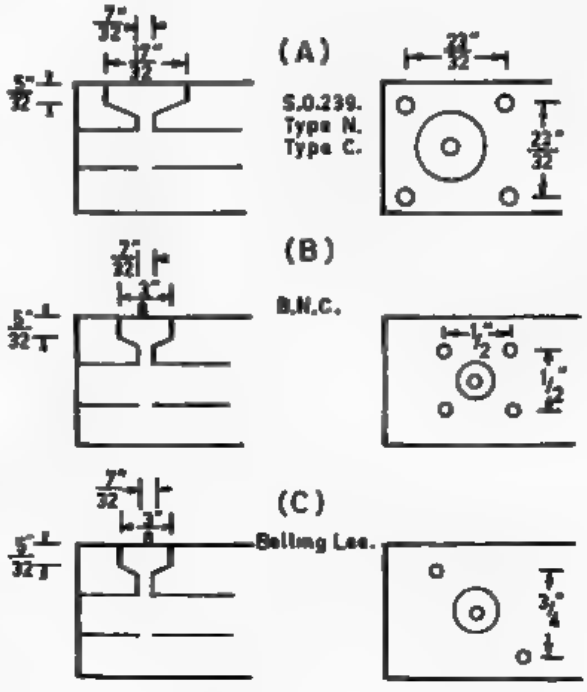


FIG. 3. CONNECTOR DIMENSIONS.

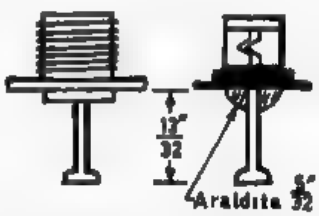


FIG. 4. (S.O.239)

FIG. 5. (Belling Lee)

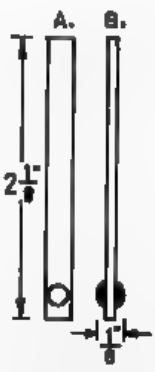


FIG. 2. CONTACT LEAF.

* 2 Clarendon St., Avondale Heights, Vic., 3034.

Solid State Device Patent Application in 1925

On 22nd October, 1925, Dr. Julius Edgar Lilienfeld filed an application with the Canadian authorities for a patent headed "Method and Apparatus for Controlling Electric Currents". A simular application was lodged in the U.S.A. on 8th October, 1926. The patent, number 1,745,175 was granted in U.S.A. on 1st January, 1930.

The patent states: "The invention relates to a method of and apparatus for controlling the flow of electric current between two terminals of an electrically conducting solid by establishing a third potential between said terminals; and is particularly adaptable to the amplification of oscillating currents such as prevail, for example, in radio communication." The preamble goes on to explain that the device has for its object to dispense entirely with thermionic devices.

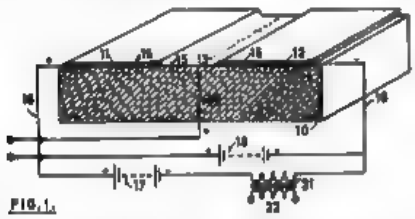


FIG.1.

The suggested construction is that a base member of suitable insulating material, such as glass, be used, and on the upper surface a pair of conducting members, such as a coating of platinum, gold, silver or copper, be provided over the glass surface by one of the well known methods, the two conducting members to be located as closely as possible to each other, and substantially midway of the same is provided an electrode member of minimum dimensions to reduce capacity. This electrode member should preferably consist of aluminium foil approximately 0.0004" thick.

The surface of the device is coated with a compound having the property of acting with the foil electrode as an element of uni-directional conductivity. The thickness of the coating is minute and of such a degree that the electrical conductivity there through would be influenced by applying thereto a suitable electrostatic force.

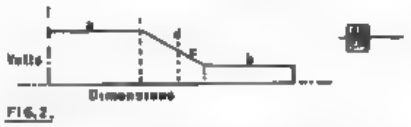


FIG.2.

The patent goes on to outline suggested compounds and how they may be applied, the theory behind the device and suggested uses to which it may be put. The patent includes a sectional view of the device (reproduced herewith) and suggested circuitry in which the device may be used. The complete patent covers three foolscap pages, far too long for reproducing in full, but from the foregoing it is easy to see the for-runner of our present day solid state devices. Whether or not devices of this type were ever produced we do not know, although we can envisage problems in the manufacture of the foil in 1930, and the use of precious metals would add considerably to the cost, not that the metals used today are cheap.

Since writing the foregoing, a copy of "Spectrum," published by Auckland V.h.f. Group Inc., has come to hand. This publication has a small item, which we take the liberty of quoting in full. It sums up the matter far better than anything further we can write.

"Dr. Julius Edgar Lilienfeld applied for patents on solid state device on 22nd October, 1925, and 8th October, 1926. The patent, U.S. No. 1,745,175, was granted on 8th January, 1930, for what is now known as a NPN transistor. Dr. Lilienfeld was also granted patents No. 1,877,140 and 1,900,018 on 11th September, 1932, and 7th March, 1933, respectively, for two developments, one being an NPPN device. He also worked on the use of PN junctions as variable capacitors."

☆

FAIRCHILD'S 7400 TTL SERIES LOCALLY PRODUCED

Fairchild has entered the market as a major supplier of 7400 series integrated circuits. For its first penetration into this general purpose TTL market, Fairchild is offering 24 ceramic Dual-in-Line products at prices that are competitive.

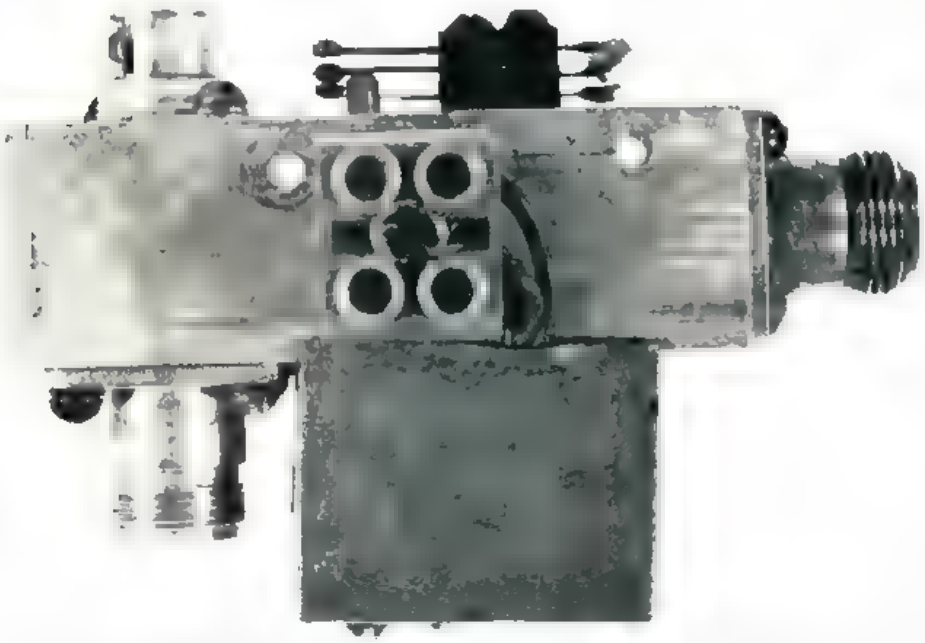
In function and pin configuration, the Fairchild Series 74' circuits are exactly equivalent to existing 7400's and can be plugged into sockets without system or interchangeability problems. They are identical electrically and have the same parameter distributions.

This series consists of 17 gates, six flip-flops, and a BCD to decimal decoder/driver (the 7441). Included in the series are the 7408 quad 2-input AND gate, and the 7411 triple 3-input AND gate, which are the only AND gates offered at regular speeds by a major 74' supplier

These circuits will be followed by a succession of 74' MSI elements.

The Fairchild devices, which operate in a temperature range of 0°C. to 70°C, offer ceramic reliability at plastic prices.

☆



Co-axial Relay [see article on opposite page]

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

APPEAL FOR MORSE KEYS

Editor "A.R.," Dear Sir,

In the course of my work I have been asked by a number of people how they can learn Morse Code for various P.M.G. licences.

It is no trouble in regard to the receiving, as AX2WJ transmits Morse at a variety of speeds, every night, to my knowledge. The trouble comes when they ask where they can obtain a Morse key. I haven't been able to locate any commercial source of Morse keys, the standard P.M.G. style I refer to. I would appreciate it if anyone could inform me of either a source of secondhand keys or of new ones. If you know the prices of them this would be appreciated too in the case of secondhand ones.

These keys are not for me but for a number of chaps who wish to go for the Morse ticket in various exams. Can you help them?

Rodney Champness, AX3UG

(If readers can assist, please write to Rodney at 24 O'Dowds Road, Warragul, Vic., 3820.—Ed.)

SERIES A.C. CIRCUIT

A Typical Examination Question in A.C. Theory is Answered in Detail

LECTURE NO. 6

C. A. CULLINAN, VK3AXU*

QUESTION

A series circuit consists of a resistance of 25 ohms, an inductance of 0.15 H. and a capacitance of 100 μF. Power is supplied to this circuit at 500 volts 50 cycles per second (50 Hz.).

FIND

(a) The voltage across the resistances.
(b) The voltage across the inductance.
(c) The voltage across the capacitance.
(d) The total power taken by the circuit.
(e) The useful power used in the circuit.
(f) The current flowing in the circuit.

The questions are typical of those frequently asked in examinations, therefore it is proposed to analyse the circuit in considerable detail to obtain the answers, because a complete knowledge of such a circuit is vitally important in understanding basic A.C. theory.

Comment: The various portions of the question have been deliberately placed out of the correct sequence required to obtain the answers. This is done to make matters more difficult for the examination candidate and to help the examiner obtain a better assessment of the candidate's ability.

For an a.c. circuit, Ohms Law may be written:—

$$\text{Current} = \frac{\text{Voltage}}{\text{Impedance}}$$

where impedance is the a.c. resistance.

Now, in order to answer parts a, b, c, d, and e of the question, it is necessary to solve f, i.e. find the current flowing in the circuit.

Since the impressed voltage and the frequency are stated, it will be necessary to determine the impedance of the circuit from the stated values of resistance, inductance and capacity.

Basically this is done by using the Theorem of Pythagorus, which states that in a right angled triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides, i.e.

$$\text{Hypotenuse}^2 = (a + b)^2$$

where a and b are the other two sides.

This equation can be transposed to find the length of the hypotenuse when the lengths of the other two sides are known and becomes:—

$$\text{Length of Hypotenuse} = \sqrt{(a + b)^2}$$

Now one of the properties of an inductance is that it tends to retard the flow of an a.c. current and can be considered to be a resistance and this is known as Inductive Reactance or XL, and mathematically is always a positive quantity.

* 6 Adrian Street, Colac, Vic., 3250.

● Continuing the series of lectures by C. A. Cullinan, VK3AXU, at Broadcast Station 3CS for students studying for a P.M.G. Radio Operator's Certificate.

A capacitance also exhibits the property of reactance known as Capacitive Reactance or XC and mathematically it is always negative.

In radio work the letter J is often used to indicate reactance. In this context the letter J has nothing to do with the letter J used in mathematics.

Inductive Reactance is derived from the formula:—

$$XL = 2\pi fL \text{ ohms}$$

where f is the frequency in cycles per second, and L is the inductance in henries.

Capacitive Reactance is derived from the formula:—

$$XC = 1 \div 2\pi fC$$

where f is in cycles per second, and C is in farads.

A circuit or an inductance has the property of inductance when there is an electromotive force set up in it due to a change of current through it.

A circuit has an inductance of one henry when a change of current of 1 ampere per second induces an electromotive force of 1 volt.

A circuit or capacitance has a value of one farad when a change of 1 volt per second produces a current of 1 ampere.

As the farad is a very large unit, it is usual to convert the farad into micro-farads, one micro-farad being 1 millionth of a farad.

A capacitance of 1 farad occurs when a difference of voltage produces a change of 1 coulomb.

The **impedance of an a.c. circuit** is the equivalent of the hypotenuse in the Theorem of Pythagorus and the formula is stated:—

$$\text{Impedance (Z)} = \sqrt{R^2 + (XL - XC)^2}$$

If the circuit contains only resistance and inductance, formula becomes:—

$$Z = \sqrt{R^2 + XL^2}$$

and if it only contains resistance and capacity, is then

$$Z = \sqrt{R^2 + (-XC)^2}$$

It must be remembered that all components used in a.c. circuit will have some ohmic resistance which may be the R in the above formulae.

The next step is to determine the reactance of the inductance and of the capacitance.

$$\begin{aligned} XL &= 2\pi fL \\ &= 2\pi \times 50 \times 0.15 \\ &= 2 \times 3.1416 \times 50 \times 0.15 \\ &= 3.1416 \times 15 \\ &= 47.12 \text{ ohms to 2 decimal places.} \end{aligned}$$

$$\begin{aligned} XC &= 1 \div 2\pi fC \\ &= 1 \div [2\pi \times 50 \times (100 \div 10^6)] \\ &= 1{,}000{,}000 \div (2\pi \times 50 \times 100) \\ &= 31.83 \text{ ohms to 2 decimal places.} \end{aligned}$$

Now that we know the reactance, we can determine the impedance.

$$\begin{aligned} Z &= \sqrt{R^2 + (XL - XC)^2} \\ &= \sqrt{25^2 + (47.12 - 31.83)^2} \\ &= \sqrt{25^2 + 15.29^2} \\ &= \sqrt{625 + 233.78} \\ &= \sqrt{858.78} \end{aligned}$$

Therefore

$$Z = 29.3 \text{ ohms.}$$

$$\begin{aligned} \text{Current} &= \text{Volts} \div \text{Impedance} \\ &= 500 \div 29.3 \end{aligned}$$

Answer to (f):

$$= 17.06 \text{ amperes.}$$

We may now determine the voltage drop across each of the components.

From Ohms Law, $E = C \times R$.

Therefore question (a) resolves into:

$$\begin{aligned} E &= 17.06 \times 25 \\ &= 426.5 \text{ volts.} \end{aligned}$$

Therefore question (b):

$$\begin{aligned} E &= 17.06 \times 47.12 \\ &= 803.86 \text{ volts.} \end{aligned}$$

Therefore question (c):

$$\begin{aligned} E &= 17.06 \times 31.83 \\ &= 543.0 \text{ volts.} \end{aligned}$$

Comment: An examination of the above answers shows a curious situation in that the voltage drop across the two reactances are each greater than the impressed voltage. This can happen, and in design work it is necessary to take such voltages into consideration.

Although not asked for in the question, let us check our calculations, remembering that we took them only to two decimal places.

Once again we base our calculations on the Theorem of Pythagorus.

$$\text{Impressed voltage} = \sqrt{\text{ohm. drop}^2 + (\text{induct. dr.} - \text{cap. dr.})^2}$$

(In above equation the abbreviations are ohmic drop, inductive drop and capacitive drop respectively.)

$$\begin{aligned} &= \sqrt{426.5^2 + (803.86 - 543.0)^2} \\ &= \sqrt{426.5^2 + 260.86^2} \\ &= \sqrt{181{,}902.25 + 68{,}047\,94} \\ &= \sqrt{249{,}950\,19} \\ &= 499.94 \text{ volts.} \end{aligned}$$

The slight discrepancy between the actual impressed voltage and the above proof is due to taking the various results only to two decimal places, also π was taken only to four decimal places.

The student should calculate all the above to at least four decimal places.

Question (d). Find the total power taken by the circuit.

Comment: Power may be expressed by two formulae:

P = volts × amperes

P = current^2 × impedance.

Let us use the first formula. Therefore

$P = 500 \times 17.06$

$= 8{,}530$ watts.

Now we check with the second formula. Therefore

$P = 17.06^2 \times 29.3$

$= 8{,}527.57$ watts.

Again the discrepancy is due to taking results to two decimal places.

Answer to (d): 8,530 watts.

Question (e). Find the useful power used in the circuit.

Comment: In a perfect a.c. generator the current and the voltage will be exactly in step, or as more commonly expressed, they will be exactly in Phase. A good knowledge of the meaning of Phase is essential for an understanding of a.c. theory.

Reverting to a simple a.c. generator, we know that the current rises from zero to maximum in one direction, drops to zero, rises to maximum in the opposite direction, then drops to zero again to complete one complete cycle. In a perfect generator the current and voltage will both be exactly in phase, that is each rises and falls identically to the other, although the amplitudes may be greatly different.

Such a generator is said to have Unity Power Factor as all the power produced by it can be used.

Now if a.c. power is fed into a load which is a pure resistance, then all the power flowing into the load will produce work.

However, if the load also contains reactance, then not all the power flowing into the load will produce useful work.

A familiar object is an electric toaster using a flat element made of resistance wire wound on thin mica. Such an element has very little reactance and even at broadcast frequencies the inductance is so low that toaster elements can be used as artificial aerials. True, they may get very hot in spots, but I have used them quite satisfactorily at powers up to 2,000 watts. Such elements exhibit very close to unity power factor.

Another familiar object is an ordinary electric radiator bar. This consists of a length of resistance wire wound in the form of a coil on a ceramic rod. Such an element has considerable inductance and it is useless as an artificial aerial at radio frequencies unless the reactance is "tuned out". Even at power line frequencies, there is a little reactance so the power factor is less than unity and not quite all the power flowing in the element produces work.

In an a.c. circuit an inductance tends to retard the flow of current or cause it to lag behind the voltage so that the voltage and current are no longer exactly in phase.

On the other hand a capacitance will cause the current to lead the voltages, again changing the phase.

When a load is connected to any power supply authorities system, the power taken by the load is measured by a watt-hour meter and this is the power you pay for, so if the load is a pure resistance you get full work for all the power you have bought. But, if the load contains reactance, you do not get useful power from all you bought, because what is termed "power factor" is less than unity.

Question (e) requires us to find the true power in the circuit, that is, the power which is producing work.

To do this we must find the Power Factor of the circuit because the Power Factor is the ratio of the True Power to the Apparent Power.

Mathematically Power Factor is the Cosine of the angle of lag or lead of the current.

To obtain Power Factor it is necessary, firstly, to find the tangent of the angle of lag or lead, that is:—

$$\text{Tan } \phi = \frac{\text{Reactance}}{\text{Resistance}}$$

We have found already that the values of the two reactances are XL = 47.12 ohms and XC = 31.83 ohms. We add these algebraically to obtain the nett reactance.

$47.12 - 31.83$

$= 15.29$ ohms.

Therefore Tan $\phi = 15.29 \div 25$

$= 0.6$

$= 31°$ (from tables).

Secondly, find the cosine of this angle.

Cos $31° = 0.86$ (from tables).

We have already found that the power being measured by a watt-hour meter (apparent power) = 8,530 watts. We can now complete the answer to question (e), the useful power in the circuit, that is the power which produces work.

True Power =

Apparent Power × Power Factor

$= 8{,}530 \times 0.86$

$= 7{,}335.8$ watts.

Comment: The importance of using equipment with a power factor as close to unity as possible can be seen from this example where it will be noticed that 194.2 watts of power are paid for but not used. The majority of public power supply authorities give a reduction in rates when a large user includes power factor correction equipment in his plant since the closer the public demand is to unity power factor the less "useless" power has to be generated.

ANSWERS

The answers to the questions are:—

(a) 426.5 volts
(b) 803.86 volts
(c) 543.0 volts
(d) 8,530 watts
(e) 7,335.8 watts
(f) 17.06 amperes.

Observation: The current through a series circuit is the same through each element of the circuit.

The voltage across each element may differ considerably.

The closer the power factor is to unity, the more efficient will be the circuit.

☆

AUSTRALIS NEWS

BALLOON TEST FOR TRANSLATOR

It is hoped to fly a one-channel version of the AO-B satellite translator system on a balloon to be launched from Mildura during August.

The hard-limiting translator will have an input on Channel B (146.00 MHz.) and output on 432.17 MHz. Power output will be in the order of 2 watts and deviation will be ±25 KHz. From a height of 105,000 feet, the balloon-borne translator should be in range of southern VK2, VK3 and eastern VK5 for about five hours, following a dawn launch.

It is hoped that this will be the first of a series of such flights, leading up to the launching of the AO-B satellite late next year. All suitably equipped Amateurs are welcome to communicate through the balloon package.

Approximate launch dates will be announced on Divisional broadcasts and those wanting further information should contact Kevin Bond, VK3ZKB, 61 O'Shannessy St., Nunawading, Vic., 3131.

MANAGER VISITS U.S.A.

Les Jenkins, VK3ZBJ, the AO-B Project Manager, will travel to the U.S. in early August for detailed discussions with A.M.S.A.T. on the construction of the AO-B flight unit.

Les will sort out with A.M.S.A.T the many design details involved in building the satellite and he will see what opportunities exist for further VK participation in Amateur Radio space activities.

— · · · —

RADIO PARTS EXTENDS

Additions to Radio Parts' Melbourne warehouse have provided over 18,000 sq. ft. of extra showroom and store space, in addition to approx. 12,000 sq. ft. of car parking on the roof of the new building

The test equipment and instrument section has been enlarged so that a larger selection of transmitting gear and receivers can be displayed.

— · · · —

CHANGE OF PHONE NO.

Communications aerial manufacturer Belling & Lee (Australia) Pty. Ltd. have a new phone number in Melbourne. It is 729-0621 which may be dialled direct within the metropolitan area.

CALCULATION SIMPLIFIED

FOR F, L AND C

A. T. CAMPBELL, G3PEQ

[For many people, formulae can be very off-putting. Those who revel in the purity of mathematics may raise an eyebrow as they read this article—but it is common-sense, and should make things a lot easier for many others while, as our contributor shows, giving answers near-enough for all practical purposes.—Ed.]

$$f = \frac{1}{2 \pi \sqrt{L C}}$$

This equation, fundamental in radio, is often considered a nuisance to solve. If a large number of accurate solutions is required this is true, even if logarithms are used, although if less accuracy is acceptable the nomogram (abac) offers a quick and easy way of obtaining the answers. But for **practical** purposes, where absolute accuracy is not necessary, the equation can easily be solved in the head by the method which follows.

The expression π occurs in the denominator. If you are working with a g.d.o., the scale of which is not likely to be less than 5% in error, and are using 20% tolerance capacitors, then it is ridiculous to say $\pi = 3.14159$: Call π 3 and the arithmetic is at once reduced, and any error resulting is likely to be less than the errors arising from coil-winding.

The equation then reduces to

$$f = \frac{1}{6 \sqrt{L C}}$$

If in addition we are working in μH., pF. and MHz. the equation becomes:

$$f = \frac{1{,}000}{6 \sqrt{L C}}$$

and we are able from this to evolve the following simple rules for obtaining f:

(a) Multiply the values of the inductance and capacity together;
(b) Take the square root of the answer;
(c) Divide this into 1,000;
(d) Divide the result by 6 and the answer is the frequency in MHz., near enough.

Do all calculations mentally, approximating where convenient.

Example 1:

What is the frequency of a circuit in which L is 10 μH. and C is 100 pF.?

Answer:

LC = 10 × 100 = 1,000

$\sqrt{L C}$ is about 30

1,000 ÷ 30 is about 30

f = 30 ÷ 6 = 5 MHz.

Example 2:

L is 3.5 μH. and C is 27 pF.

Answer:

LC = 3.5 × 27 = 94 (approx.)

$\sqrt{L C}$ is about 10

1,000 ÷ 10 = 100

f = 100 ÷ 6, about 17 MHz.

If you are having difficulty in extracting those square roots in your head, you can be shown in a minute how to do it. Meanwhile, the mathematical types, with table books at hand, might note that quite an accurate answer can be obtained as follows:

(a) Multiply the values of the inductance and capacitance together;
(b) Look up their square root;
(c) Look up the reciprocal of this;
(d) Multiply the reciprocal by 1,000;
(e) Divide by 6.

Because we assumed the value of π to be 3, this result will be about 5% too high; if you correct for this, you will be very near indeed to the correct value of f.

Those Square Roots

Now to the mental calculation of square roots. In the first place, do not be afraid of continually approximating; as a rule, the errors caused by approximating will eventually nearly cancel out. In Example 1 we said $\sqrt{1{,}000}$ is "about 30". Actually, it is 31.6; and we said 1,000 ÷ 30 is "about 30" whilst it is really 33.3. The result we obtained, however, 5 MHz., is exactly right!

First, the square roots of numbers up to 100. We all know the square of the first ten numbers. Just take the nearest square and give its root as the required value. If you aim at greater accuracy than this—and it is sufficient—then you can obtain the squares of all numbers-and-a-half by multiplying the number by the succeeding one and adding ¼:

$1\frac{1}{2}^2 = (1 \times 2) + \frac{1}{4} = 2\frac{1}{4}$
$2\frac{1}{2}^2 = (2 \times 3) + \frac{1}{4} = 6\frac{1}{4}$
$3\frac{1}{2}^2 = (3 \times 4) + \frac{1}{4} = 12\frac{1}{4}$
$8\frac{1}{2}^2 = (8 \times 9) + \frac{1}{4} = 72\frac{1}{4}$

and so on.

When a number contains more than two figures, proceed as follows, using 43259 and 6573 as examples.

(a) Divide the number into pairs of figures from the right:—4-32-59; 65-73;
(b) Find the nearest square root of the last figure or figures on the left: 2; 8;
(c) Add a zero for each **pair** of succeeding figures: 200; 80.

By the use of Table 1, even the small amount of calculation involved so far can be avoided—just multiply L and C together as previously and look up the required frequency in the table. The table can also be used in reverse. For example. What inductance is required to resonate with 100 pF. at 3.6 MHz.? From the table, LC for 3.6 MHz. is 2,000, therefore L = 2,000 ÷ 100 = 20 μH.

If you are interested only in the Amateur h.f. bands, then Table 2, for which the writer is indebted to G3SZW, will give you all you require.

☆

Inductance, Capacitance and Frequency

LC	f	LC	f
8000	1.8 MHz.	100	15.9 MHz.
7000	1.9 „	95	16.3 „
6000	2.0 „	90	16.8 „
5000	2.2 „	85	17.3 „
4000	2.5 „	80	17.8 „
3000	3.0 „	75	18.4 „
2000	3.6 „	70	19.0 „
1000	5.0 „	65	19.7 „
900	5.3 „	60	20.5 „
800	5.6 „	55	21.5 „
700	6.2 „	50	22.5 „
600	6.5 „	45	23.7 „
500	7.1 „	40	25.1 „
400	8.3 „	35	26.9 „
300	9.2 „	30	29.1 „
200	11.3 „	25	31.8 „

Table 1.

Amateur Bands f, L and C

f	LC	f	LC
1.8	7818	14	129
3.5	2067	21	57
7.0	517	28	32

Table 2.

A & R-SOANAR S.A. OFFICE

A new branch office for the expanding A & R-Soanar Electronics Group was opened at 470 Morphett St., Adelaide, on 1st July. Under the management of Mr. David Scott, who was formerly S.A. manager Plessey-Ducon, the new office includes warehouse facilities for the full range of A & R electronic equipment and transformers in addition to the Soanar electronics components agency lines, Elna, Piher, Sato and I.T.T. Mr. Scott will be available to customers for technical assistance, and may be contacted on 51-6981.

OBITUARY

ROBERT W ROSE, VK2AQR

We regret that we have to record the passing of another old-timer from the ranks of Amateur Radio, in the person of R. W (Bob) Rose, VK2AQR, whose death occurred suddenly on 11th May last in hospital at Gosford.

Bob received his Amateur ticket in Brisbane in 1929, and, until he transferred to New South Wales in 1950, operated mainly in the town of Longreach, firstly under the call of VK4RR and later as VK4RQ.

On arriving in New South Wales, he was given the call VK2AQR and operated from Warragamba, West Wallsend, and finally from Avoca Beach. During his time in N.S.W he operated in the 7 and 3.5 MHz. bands only, and was a foundation member of a well known net, "The Goon Show".

To Mrs. Mabs Rose and three sons (Barry, Trevor and Lindsay) we extend sincere sympathy on behalf of all members of the Amateur Radio fraternity.

* Reprinted from "The Short Wave Magazine," March, 1970

Low-Cost Solid State Power Supply for Carphones and Pye Reporters

C. K. MAUDE,* VK3ZCK

The unit described is made from readily available cheap components, which many Amateurs will have in their spare part trays and those boxes of bits that have been saved as they might come in handy for something.

The power supply is a d.c./d.c. converter operating from 12 volts at a frequency of about 3 KHz., and is powered by a pair of general purpose type power transistors. The prototype was tried with both NPN and PNP germanium and silicon transistors and all seemed to work satisfactorily. A prototype of this unit was built some five years ago by the writer and has only failed once when a dry joint came apart.

The advantage of this circuit is the wide range of component variations that can be used.

The main points to watch are:—

1. The ratio of primary to feedback turns be between 2.5 and 3.5:1.
2. The ratio of R1 to R2 be between 35 and 50:1.
3. The transistors should be similar but need not be matched pairs.
4. Use good quality urethane or nylon insulated wire in preference to the more common enamel.

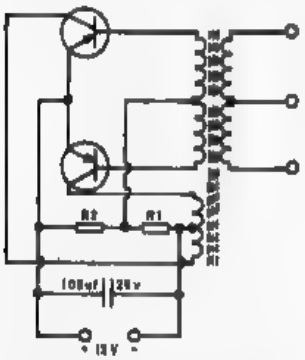


FIG. 1. CIRCUIT DIAGRAM.

Typical values of R1 and R2 (ohms)

1.5	40
4.0	100
10	150
22	330

Note.—When using NPN transistors, reverse the battery supply and 100 uF capacitor.

COMPONENTS

1 pair of Ferrite U cores from an old t.v. e.h.t. transformer, making sure that the cross sectional area is not less than 1.5 sq cm.

1 pair of suitable power transistors, e.g. OC26, OC28, OC35, NKT404, 2N301, 2N174, 2N3055, etc.

1 heat sink of at least 18 square inches, finned and blackened, or two smaller ones can be used if they are firmly affixed to the transceiver chassis.

2 ten-watt resistors, R1 between 1.5 and 50 ohms, and R2 between 40 and 560 ohms, see note 1 above.

Sufficient 18 s.w.g., 20 s.w.g. and 26 s.w.g. wire.

Before winding the transformer, establish the type of rectification used in the present power supply in-built in the unit, and wind the secondary so that the diodes and filtering can be used.

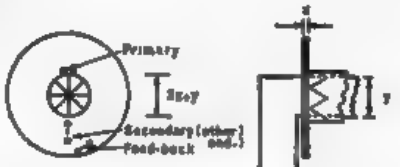


FIG. 2. FORMER DETAIL.

CONSTRUCTION

First remove the old windings from the Ferrite core by cutting through them with a hacksaw and peeling them off, then place the core on the edge of the work bench such that the joins are along the edge. Put one hand firmly on the half on the bench and with a brisk stroke hit the other half with the palm of your hand, this should break it clean through the join. Clean off any old resin that remains on the core, any that is on the mating ends should be carefully rubbed off using fine emery paper.

Next make a paper tube using three or four layers of thick brown paper that will be a loose fit on the ends of the core and of length that just fits across the open end when the core is assembled.

Now cut two discs of thick (1/8") card one and a half inches diameter, and in the centre of each scribe a circle whose diameter is that of the core **plus** twice the thickness of the cardboard discs, and cut this circle into eight segments, see Fig. 2.

Push one of these discs over each core and assemble with the paper tube between the core and the segments (see Fig. 3). Now wind four turns of thick brown paper over the bobbin, gluing continuously with a shellac cement. Allow to dry for half an hour and remove the cores and shellac from the whole bobbin and allow to dry over night.

Drill two 1/8" holes in one side of the bobbin, the first near the centre, the other 1/4" away 1/8" up from the centre. Through the first hole poke a 4" length of cambric sleeving and thread two ends of 16 s.w.g through until about one and half inches protrude.

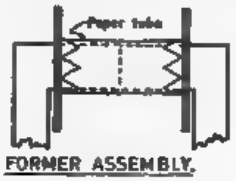


FIG. 3. FORMER ASSEMBLY.

Wind on two 20 turns bifilar, this winding will extend across the bobbin and back, now poke the remaining ends through the second hole in the bobbin and slide a 4" length of sleeving over these wires as was done at the start. Bind this winding with the adhesive tape marketed for this purpose or you can use ordinary masking tape as used by spray painters. **Do not** use plastic insulation tape or cellotape as these melt when they get warm.

Drill another hole in the bobbin on the opposite side slightly above the primary winding and poke a length of sleeving through. Using the 26 s.w.g. wire, wind on sufficient turns for the secondary voltage using the table below.

Type of Rectifier	D.C. Volts Required	No. of Turns	Volts per Turns
Voltage Doubler	260	190	1.4
Bridge	200	290	0.7
Full Wave	150	2 x 300	0.5

Other d.c. voltages can be calculated from these figures to suit your needs.

After winding on the required number of turns, drill another hole in the bobbin and terminate the wire as before.

FIG. 4. WINDING DETAILS.

The feedback winding is wound last and it is suggested that a few extra turns be wound on and the excess be removed until oscillation ceases, then rewind with two turns more than the number at which oscillation ceased. The calculated number of turns for the feedback winding is 2 x 6, but start with 2 x 7. Terminate these windings as before, assemble the transformer and test by adjusting the feedback winding as described. When oscillation is satisfactory, bind the transformer with tape and re-assemble, using the brackets and screws used on the original.

The models built by the author have been for 20, 25 and 30 watts and no sign of overheating or transistor damage has occurred.

Remember, when mounting the transistors, to use the proper mounting hardware including the insulating washers.

*2 Clarendon St., Avondale Heights, Vic., 3034.

Miniwatt Digest, Vol. 2, No. 1, Oct. 1962, Vol. 2, No. 2, Nov 1962.
Mullard Outlook (reprint)" Transistorised Inverters and D.C. Converters.
"CQ" April 1979: Simple D.C. Converters.

NEW CALL SIGNS

MARCH 1970

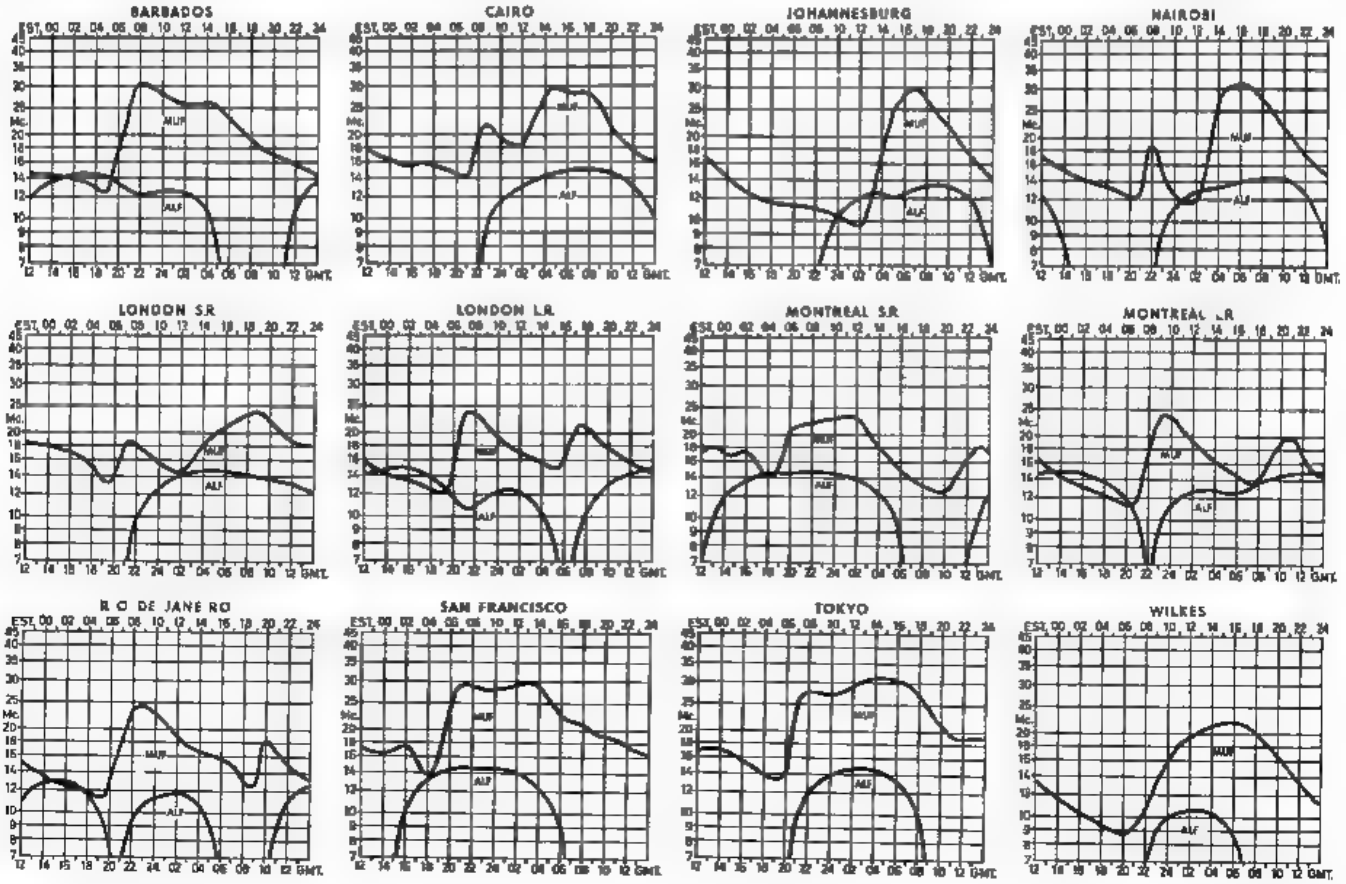
VK1EG—J. E. Gerber, 9/5 Northbourne Flats, Turner, 2601.
VK1ZPC—P. M. Cohn, Station: Honeysuckle Creek, Tracking Station, Postal: P.O. Box 468, Manuka, 2603.
VK3AIK—R. White, 2/4 Phillip St., Petersham, 2049.
VK3AZY—B. A. Taylor, 6 Uralba Pl., Dundas, 2117.
VK3BBL—F. Diyorio, Station: 3 Bronte Pl., Winston Hills, 2153, Postal: P.O. Box 36, Baulkham Hills, 2153.
VK3BDC—D. A. Clift, 152 Rusden Rd., Blackland, 2774.
VK3BFB—F. B. Crum, 27/14 Blues Pt. Rd., McMahons Point, 2060.
VK3BLZ—L. L. G. Meek, 47 Turner Rd., Berowra, 2081.
VK3BPH—F. Halpin, 19 Morton St., Wollstonecraft, 2065.
VK3ZGG—G. J. Greenwood, 54/143 Kurraba Rd., Neutral Bay, 2089.
VK3ZIU—I. Binnie, 36 Tallwood Ave., Eastwood, 2122.
VK3ZJY—J. Roberts, "North Lynn," Bullawa Creek, Narrabri, 2390.
VK3ZLQ—C. L. Teo, 24 Shaw St., Petersham, 2049.
VK3ZMV—M. H. Adnams, Station: C/o. L. H. J. Johnston, 6M Peg, Sturt H'way, Trentham Cliffs, Postal: P.O. Box 248, Mildura, Vic., 3500.
VK3ZUO—W. G. Rayner, 110 Cardinal Ave., West Pennant Hills, 2120.
VK3HG—H. W. Gilbert, 1 Roseberry St., Hawthorn, 3122.
VK3JX—H. E. Michell, 3 Strahan St., Hamilton, 3300.
VK3AQX—B. S. Farmars, Tarranginnie, via Nhill, 3418.
VK3AYU—R. P. Vize, 11 Mosaman Dr., Heidelberg, 3084.
VK3BBZ—R. J. Wyllie, 36 Price St., Essendon, 3040.
VK3BDC—B. A. Cook, 41 Wells Rd., Beaumaris, 3193.
VK3BDJ—D. J. Bainbridge, Midland Motel, Mooroopna, 3629.
VK3BEG—E. W. Gibson, 56 Narracan Ave., Yallourn, 3838.
VK3YCW—A. S. White, 195 Bambra Rd., Caulfield South, 3162.
VK3YCY—S. R. Brooks, 6 Edgar Crt., Ferntree Gully, 3156.
VK4EU—D. M. West, 197 Kamerunga Rd., Freshwater, Cairns, 4870.
VK4FR—G. R. Flodine, "Clover Fields," Labey's Rd., Tamborine Mountains, 4270.
VK4KN—G. J. Cohen, Flat 2, 44 Alpha St., Taringa, 4068.
VK4ZQ—R. M. O'Malley, 24 Rachael St., Moorooka, 4105.
VK4ZIT—I. L. Tinney, 19 Fifth Ave., St. Lucia, 4067.
VK4ZOO—J. A. Gardner, Sims Esplanade, Yorkey's Knob, 4870.
VK5QJ—J. C. Hulse, C/o. Adelaide Bible Institute, Mt. Breckan, Victor Harbor, 5211.
VK5QK—K. Bartusek, 36 Wattlebury Rd., Lower Mitcham, 5062.
VK5ZPR—P. R. Banks, 9 Sixth St., Leigh Creek, 5731.
VK6GV—J. B. Wilcox, Flat 9, Alexander Crt., 31 Herdsman Pde., Wembley, 6014.
VK6HA—H. W. Wood, Station: Caversham, Postal: P.O. Box 175, Midland, 6056.
VK6LO—L. Jessop, 17 Victoria St., South Perth, 6151.
VK6PK/T—P. C. Kloppenburg, 11 Brown St., Carnarvon, 6701.
VK6ZAI—P. J. Croft, Flat 201, 53 The Esplanade, South Perth, 6151.
VK6ZAS—G. M. Ryan, 73 Cleveden St., North Perth, 6006.
VK7CY—D. J. Bradley, 40 David St., Launceston, 7250.
VK7KG—K. F. Gosling, 7 Barkers Crossing, Rosebery, 7470.
VK7SR—S. L. Radford, Station: Pat's River, Flinders Island, 7255; Postal: P.O. Box 82, Whitemark, Flinders Island, 7255.
VK7ZCH—C. H. Hocking, 20 Banawarra Rd., Geilston Bay, 7015.
VK7ZFO—J. E. Andersen, Station: Georgetown, 7253; Postal: P.O. Box 179, Georgetown, 7253.
VK8AU—D. D. Tanner, Noble's Nob Mine, Tennant Creek, 5760.

CANCELLATIONS

VK1ZWP—W. B. Pywell. Not renewed.
VK2BR—W. H. L. Brooke (Rev.) Deceased.
VK2JJ—J. L. Jones. Transferred to Qld.
VK2ABL—W. A. Easterling. Transferred to S.A.
VK2BFI—J. Ginsberg. Not renewed.
VK2ZDE—D. A. Clift. Now VK2BDC.
VK2ZEQ—J. E. Clark. Not renewed.
VK2ZFJ—J. F. Kennedy. Not renewed.
VK2ZPZ—W. Frost. Not renewed.
VK2ZZI—D. W. Friend. Not renewed.
VK3JX—J. F. Sydow. Deceased.
VK3AEM—H. E. Michell. Now VK3JX.
VK3ANL—Morwell High School. Not renewed.
VK3AYN—H. W. Gilbert. Now VK3HG.
VK3BBN—R. P. Vize. Now VK3AYU.
VK3ZFS—B. S. Farmers. Now VK3AQX.
VK3ZJG/T—G. J. Merrill. Transferred to N.S.W.
VK3ZSK—R. J. Wyllie. Now VK3BBZ.
VK4IJ—J. A. Bowden. Transferred to N.S.W.
VK4KC—G. J. Griffiths. Transferred to N.S.W.
VK4YZ—W. H. M. Hoyle. Transferred to Vic.
VK4ZCW—C. W. Brooke. Transferred to N.S.W.
VK4ZRF—G. R. Flodine. Now VK4FR.
VK4ZRM—R. M. O'Malley. Now VK4ZQ.
VK4ZWC—W. E. G. Cockburn. Transferred to S.A.
VK5IC—D. H. Watkins. Transferred to N.S.W.
VK5JT—J. Kilgariff. Not renewed.
VK5ZAH—P. R. Parise. Not renewed.
VK5ZAK—A. O. Kwitko. Not renewed.
VK5ZDD—K. Bartusek. Now VK5QK.
VK5ZFW—A. S. White. Now VK3YCW.
VK6ZEA—L. Jessop. Now VK6LO.
VK6ZGK/T—P. C. Kloppenburg. Now VK6PK/T.
VK6ZGN—J. B. Wilcox. Now VK6GV.
VK7DL—Deloraine High School Radio Club. Not renewed.
VK7ZCY—D. J. Bradley. Now VK7CY.
VK7ZLR—S. L. Radford. Now VK7SR.
VK8AF—J. Sisson. Not renewed.
VK9HR—R. J. Hester. Transferred to S.A.
VK9KC—C. M. Hayes. Transferred to W.A.
VK0KB—K. E. Beman.
VK0MI—W. J. Grudfield.
VK0RM—R. McLean.

PREDICTION CHARTS FOR AUGUST 1970

(Prediction Charts by courtesy of Ionospheric Prediction Service)



DX

Sub-Editor: DON GRANTLEY
P.O. Box 222, Penrith, N.S.W., 2750
(All times in GMT)

Again there has been a general tapering off from the good conditions we have been experiencing, and apart from the interest created by Gus, there has been little of unusual interest. Sunspot numbers for August and September are 85 and 83, the latest confirmation to hand being of March with 101, including a mid-month lull.

As I mentioned, Gus Browning is creating most of the DX interest this month and much has been written and spoken over the air about his current jaunt. For the information of those chaps who have been chasing the newies, here is the list of calls which he has and will have used: FH8VP will be Comoro, FR0VP/J Juan de Nova, FR0VP/E Europa, FR0VP/BI Bassa de India, FR0VP/G Glorioso, FR0VP/T from Tromelin. A series will be used with the VQ9/A call, and they are /A/A Aldabra, /F Farquhar, /D Desreches, VQ8CP/A Algalea, VQ8/A/C Chagos, AC8A/GR Geyser Reef, AC9/A/BR Blenheim Reef.

Roy ZM1AAT/K has indicated that he will be returning to the mainland about the end of October, meantime he is flat out trying to accommodate all who need the Kermadecs both on v.h.f and the DX bands.

VK0LD is still active from Macquarie Is. in between his commercial commitments. Conditions to this locality are not reliable for skeds, however George ZL2APZ will accommodate any additions to the list on 14250 on Thursdays at 1000z.

All contacts made with Barry ZM1BN/A from Snares will be acknowledged, and about another 700 QSLs will see this project completed.

Recently there has been some consternation on 20 by the operation of a station signing himself 3L2A and giving a ZL as his QSL manager. Now I am not sure whether the QTH which he gives as Hudson Rock is some modern teenage dance, or an old-time toffee, but it seems very unlikely that it is the location of a genuine DX station. Nothing is known officially at the time of writing.

Galapagos Is. has become known to most of us as a wild life haven, due to the excellent t.v. documentaries by H.R.H. Prince Phillip, however closer to the heart of the Amateur is the fact that HC8GS is active from that location and has a sked on Tuesdays at midnight G.M.T. on 14220 with K3RLY, and breakers are welcome.

VK/ZL contacts are being catered for by 5V2WT, TT8AF and TR8DG using 14265 Sundays from 0600. TT8AF asks for his QSLs to C/o. J. Fremont, Box 444, Ft. Lamy, Chad, whilst the other two go to W4SPX, Paul R. Swanlix, 1722 Dorris Dr., Orlando, Fla., 32801.

Information to hand from Syd VK2SG in respect to the operation of Ken VK9KY, from Cocos-Keeling. Ken will be going QRT from that location as from 18th August, however cards for the operation will continue to be handled by Syd until all are answered. All cards which have been received to date have been answered, however there has been a little delay with cards received via the Bureau, and cards which have been received with only one I.R.C. have been returned via the Bureau, thus these could be delayed somewhat. To date Ken has 134 countries confirmed from Cocos Keeling, and some are still outstanding. This is good going, because it must be remembered that the station was off the air for six weeks due to a burned out power transformer. I endorse Syd's remarks to the effect that Ken has given the boys a good spin, considering he has had to do his normal work as well, nevertheless I would like to add a word of thanks to Syd for his handling of the QSL chores. This is no light task, and Syd is to be commended for his efforts. Further operation from the location by VK9KY's relief is possible.

It has not been my policy to include long lists of stations worked or heard, however there are occasions when an outstanding log comes to hand, and often this comes from S.w.l. Steve Ruediger over in VK5. The following stations have been logged and recorded, the tape being on the recorder in the shack as I write these notes. ZF1GC, VP5NB, 8R1J, 8P6AZ, HR2WTA, LI2B, 7Q7LZ, CR7IFR, CN8HL, MP4BHH, VP7NA, FB5YY, OJ6DX, CO-2LM and PJ2CC. These are the pick of the crop, there are many others. The 7Q7 and CR7 were on ten metres, others on 20.

Two stations presently active from West Pakistan are AP2MR who has been working on 40 metres, and says QSL via VE3ACD. AP2KS is very active, and QSLs go to K6TWT.

Canary Is. is represented at the moment by EA8GZ and EA8HA. The former, a YL, is usually on 21150 or 14267 and her QTH is Christina Labin, Box 21, Icod, Tererife, whilst DL1CF is the manager for EA8HA QSOs after 17th Feb., 1960.

Arch GC5AJE has returned to the States and asks that all outstanding QSLs go to his home address which is Archibald C. Doty, 5380 Rushton Rd., Sth. Lyon, Michigan, 48178, U.S.A.

The operation from Mongolia by UA9VH/JT1 still continues, usually on 14300 or thereabouts, and QSLs are requested by the usual address for stations in that country: Box 639, Ulan Bator, Mongolia. If you have difficulty with your returns, try Box 88, Moscow, it works quite often.

The operation from Market Reef, the latest addition to the DX list, has been completed with over 13,500 QSOs being held. As well as the call sign OH0DX, the call OH0AM/MM was used when travelling, and all QSLs for both calls go to OH2BH, Angervoite 8-B-17, Helsinki, Finland.

Jack C2IJW due to leave Nauru on 25th June and asks that any outstanding QSLs be sent to his home address which is R. J. Wirth, 22 Berry St., Cronulla, N.S.W., 2230. Welcome home Jack, and thanks for a very fine job.

CE0ZK has been quite active over recent weeks, however despite comments that he is on Juan Fernandez Is., he is in actual fact /MM in the Pacific Ocean. Luis requests all QSLs to be sent to him at Box 3016, Valparaiso, Chile.

CR8 is represented mostly by Luis CR8AI and CR8AJ, the latter is on c.w. 14060 in the late evening local time, and his address for all QSLs is Horatio G. Torres, Box 59, Dili, Portuguese Timor.

The call DX0PAR in operation during the period of 3rd July to 5th July is a special operation by DU1PAR ops. during the anniversary of the Philippines Republic celebrations. Valid for PX hunters only.

Guadeloupe is represented at the moment by several stations, among them are FG7AC, operator Claude F8ADC, QSL to BP411 Pointe-de-Pitre, Guadeloupe, FWI. FG7TG is also well to the fore on 10 metres, also on 40 using c.w. most times. His name is Gerard and QSLs go to W8OB.

It is reported in the 23rd June issue of Geoff Watts DX News-sheet that the planned trip to Clipperton Island has been postponed until the end of the year.

There should be a station calling himself IT1SEZ/IU appearing from 6th July to 6th Sept., he is quite genuine and is operating from Ustica Is.

W4VPD/KS4 was due for a one-week operation from Swan Is. from 1st July using 200w to a tribander. Operation was scheduled for all bands, and the QSLs will be handled by himself at home QTH, which is Enos L. Shere, Jnr., 3254 SW 37th St., Miami, Fla., 33155, and enclose an I.R.C.

TT8AF is working from a list compiled by W4SPX, but to make life a little more hectic from that QTH, Gus expects to operate from there in September using the call 5VZDB.

YA1R came on the air on 4th June using 21010 and 14020 c.w. He is Roger G3SXW and has frequent skeds with his QSL manager G3TXF. 1900z is a good time to look for him.

CR9AK is still quite frequently on the air and has reported on 20, 15 and 10 metres, working into Europe. His manager is CT1BH. A further multi-band operation by some of the VS6 band is reported to have a starting date of 1st August.

JD1ABH, Ogasawara Is. (formerly Bobin Is.) is using low power of forty watts to doublets on all bands and expects to be stationed at the Chichi-Jima weather station for a period of one year.

KA1B from Minami Toroshima, formerly Marcus Is., should be active from July 2-3, with a group of operators headed by the KA9RC gang. They cannot operate on 40 or 80 because of Loran interference, however they will more than make up with their activity on the other three bands. Round the clock operation will be the order of the day and QSLs should go to WA3NZH with s.a.e. plus I.R.C. Donations towards the cost are not being solicited and will not be accepted.

For the prefix hunters, there will be a jaunt to the Central African area using an OR5 prefix for 10 months. From the OR5 QTH, they hope to visit and operate from 5H3, 5T5, 5Z4, 9Q5, 9U5 and 9X5. ON5TO, Box 33 Brugge 8000, Belgium, is making the arrangements.

From the Antarctic area Tom KC4AAD (manager K7YMG), KC4USM and KC4USV (both managed by K2BPP) are the most active. The latter QSL manager is Dave Porter, Mountainside Rd., Mendam, N.J., 07945, U.S.A.

Thor Heyerdahl continues across the Atlantic in his raft "RA 2" and has been making some contacts on the 20 metre band. I heard one of his transmissions on the tape sent to me by Steve Ruediger, and the signal was exceptionally good in the circumstances. No QSL information is to hand, but for the previous voyage he requested that they be sent to LA5KG, Box 150, Slependen, Norway, with five IRCs for the handicapped children's fund. As LA5KG is involved with this effort, the same arrangements probably still apply.

Three odd prefixes which escaped me earlier in the year were HO, used in Panama from Feb. 20 to March 14 to celebrate the XI Pan-American games, HU1 is a special prefix for major contests in Salvador, WE4SUN was a special station set up during recent observations of the eclipse of the sun.

The following stations can be added to the I.S.W.L. list of calls eligible for inclusion in the "Monitor" award: K9WJU, G3HQU, WA-6HAE, CT1OF, VK2AV (hi Art), YV1EJ, CT1MC, EP1DA, F9RO, K2RAR, G3XZS, TF1BT, F9LT, OY3B and I1KRV.

A note to hand re ON4AF. He is managed by ON4TJ, who has been out of action for quite a period due to illness, but he is now okay and now able to catch up with the ON6AF logs. If you are still missing his card, it is suggested that you send a second QSL and he will be pleased to reply. This applies to Amateur QSLs and S.w.l. reports alike.

VP5NB in the Turks and Caicos group has been very active recently and puts a very fine signal into this country. He has a QSL manager, WA5GFB, Box 462, Chickasha, Okla., 73018, U.S.A.

QTH SECTION

CR8AI—C.P. 60, Dili, Portuguese Timor, via Darwin.
FL8RC—Claude Ribault, Box 378, Djibouti, Fr. Somaliland.
HT1FP—Apto 82, Managua, Nicaragua.
KG6SY—Box 2081, Capitol Hill, Saipan, Mariana Is.
KL7GRF—Route 1, Box 142B, Ketchikan, Alaska, 99901.
ON4TJ—Georges Thys, 61 Breughellaan, De Pinte, 9730, Belgium.
PY7AWD/PY0—Box 843, Recife, Pernambuco, Brazil.
SU1MA—Box 340, Cairo, Egypt, U.A.R.
ZD8B—Box 238, M'babane, Swaziland, Africa.
ZD9R—Box 50, M'babane, Swaziland, Africa.
5T5BG—B.P. 538, Nouakchott, Mauretania, Africa.
9J2NC—Box 134, Lusaka, Zambia, Africa.
9K2BF—Box 1003, Kuwait, Arabian Gulf.

QSL MANAGERS

AC3PT—W1FLS	PJ8AA—W2BBK
CR3KD—WA4PXP	PJ8KH—W2DV
FB8XX—F2MO	PJ8PM—W2IVP
FB8YY—F2MS	SV0W1 JY—WA3HUF
GB3DX—G3JOC	UA0KIP—UW3FD
HS4ABJ—K4WHK	UA0IP—UW3FD
HS4ABV—W8PJR	VP5GM—G3WOW
HS4ADJ—WA2VTL	XW8BP—DL7FT
HS5ABD—W6DQX	5VZDB—W4SPX
KG6SM—W3CTN	6Y3GB—VE3DLC
KJ6BZ—W0EJP	6Y5XX—VP9BK
OK5FIS—OK2BHU	

The above by courtesy of Stewart Foster, DX editor I.S.W.L.

AWARDS

Worked Gotland Award 21.—You need 21 points for this one, no cross band contacts allowed. Score is based on working 8M1, 8K1 or SL1 stations from 1st July, 1970, and scoring table is 5 points for 80 metres, 4 points for 40, 3 points for 20, 15 and 10. GCR list, plus one dollar 50 cents or 10 IRCs to Awards Manager, Box 461, S-62104, Visby 4, Sweden.

Riihimaki 100 Award.—To gain this award, DX stations need only work seven OI3 stations during 1970. There is no fee and GCR list goes to Riihimaen Kolmoset r.y., Nuorisotalo, Murtokatu 3, Riihimaki, Finland. The award will be issued next year.

QSL Manager of the Month. This is not an award in the general sense of the word. Scotts QSL service, WA3UHR, Scott Frelle, 1510 Lynnview, Houston, Texas, 77055, intend to award each month as from September 1970 a trophy in the form of an engraved golden microphone on a walnut base to the top awarded QSL manager of that month. He can be situated anywhere in the world. Send your nomination to Scott, include the manager's name and call sign and your reason for nominating him.

That about winds it up for this month, 73 for now, de Don L2032.

Overseas Magazine Review

Compiled by Syd Clark, VK3ASC

"AUSTRALIAN E.E.B."

May 1970—

Complementary Symmetry Amplifiers, Part 1, N. O Kalam. An analysis of the Fairchild 3w simplified amplifier

L.T. Regulated Power Supply Design, Part 4, R.L.G. and R.A.J.B

A Nice Hi-Fi System, Part 2, A. Whittingham.

A FET E.F Q-Multiplier, T. Cenjis. Q-Multipliers are effective selectivity improving devices whether they are used at i.f. or at r.f. R.f operating devices have been increasing in popularity for some time as they add selectivity ahead of the first mixer

Review copy from the publishers of E.E.B., P.O. Box 177, Sandy Bay, Tas., 7005.

"BREAK-IN"

May 1970—

ZL3VHF, 145.8 MHz., Christchurch Branch V.H.F. Beacon, ZL3RW Describes the v.h.f. beacon installed at Christchurch. It is a valve job with an output of 30 watts.

A Helical Mobile Whip for All Bands, ZL3RW. 10, 15, 20, 40 and 80 metres. It does not change bands automatically.

Otago Branch Project, Single Sideband Exciter, 9 MHz. Phasing Type, ZL4LV. A solid state design using components which can be expected to be obtainable in VK. R.C.A. IC's CA3020A, CA3028A and CA3061 are used.

"CQ"

May 1970—

A No Compromise, Five-Band, Two-Element Quad, W4DQU. Describes a two-element design using bamboo poles and equal electrical spacing on all bands from two metres to 80 metres. The hub is made up of 44 pieces of softwood glued together with Weldwood glue. 75 ohm twin lead is used to feed all five loops in parallel and tuning stubs are not used. Loops are attached to poles by running them through copper wire eyes which are fixed to the poles by whippings

A 24-Hour Clock for the Shack, K3AAY. Describes a method of dividing mains frequency by two and using a conventional clock with new markings on the face. The hour hand takes 24 hours to rotate one full turn and the minute hand takes two hours

Upgrading the Heathkit SB-10 Sideband Adaptor, W4IBU.5 If you have an SB-10, this will interest you.

A "No Modification" 6 Metre Transmitter Converter, K2BLA. A method of modifying some of the older (pre-s.s.b.) transmitters for a.m. use on v.h.f. is described

Split Frequency Operation with the Heathkit HW-100, WA3JYI. If you have an HW-100 and wish to operate split frequency, this is your meat.

"CQ" Reviews the Yaesu Musen FTDX400 Transceiver, W2AEF These transceivers have not yet been seen on the Australian market. They are basically FTDX400 with increased transmitter input and probably some other minor mods. The reviewer seemed to like the unit he had for test.

The 6 Metre Beni II Antenna, W6GNV/4. A stacked folded dipole for six.

Late Oscar News, W3ASK

Calibrate Your Own D.C. Meters, K3STU, Part . Describes a low cost system of accurately calibrating d.c. meters.

A High Current, Low Voltage, Triac Controlled Power Supply, W5MMI. 0-34 d.c. at 40 amps or 0-12v at 80 amps Control is on the primary

Have You Mumble-itis, WB2OYF We have "Strine" I think I'd need to be a Yank to understand this.

10 Metre Anomalous Propagation with Australia-Oscar 5, WA2QMC. While the majority of Australia Oscar 5 reception reports were of a relatively predictable nature, some of the more exotic tracking efforts produced unusual results. These "anomalies" open wide new areas for speculation and investigation among Amateur space enthusiasts. This article describes one tracking group's observations.

"MULLARD OUTLOOK"

Vol 15, March/April 1970—

Mullard Visitors to I.E.C. Standards.

Four New High-Q Varactor Diodes (for use in X-band)

New 5MW Gunn Oscillator.

Highlights of Faraday Lecture—Sell-out in Four Capital Cities. 13,000 persons attended the lecture series which was delivered by Mr E. T. Emms, head of Mullard, Central Applications Laboratory, U.K. It went with a swing.

Digital Integrated Circuits. Bistable (flip-flop) stages.

Improved Lamp Dimmer Circuit.

Mullard Parametric Amplifiers for Radio Astronomy.

"QST"

May 1970—

The Two Metre QRP Mountain Topper, by W7HCV A solid state transceiver for 144.

A Nearly Full Size, Rotatable, Two-Element Quad for Eighty Metres, K3JH If you have a tower over 104 ft. high and some spare 70 ft. booms around, there is no reason why you should not duplicate this.

The IC-TT Generator, W1KLK Commercial integrated circuit kits are used in this easy to build two tone generator Oscilloscope patterns obtained from the generator are included.

Some Tips on Solid State V.F.O. Design, W1CER. Here are a few practical suggestions on basic design, showing how to lessen harmonic output, improve stability and increase the r.m.s. output.

A Solid State Selectoreid, W1ICP A transistorised version of a selective audio filter similar to the valve version described in December 1966 "QST"

A Light Weight 10 and 15 Metre Beam with Five Elements on Each Band, W5KTR. Stated to be better than a linear If used with a linear, adds more dB.

Let's Talk Transisters, Part 7. Transistor biasing circuits. R. E. Stoffels. The effect of bias voltage and power dissipation within the transistor on the stability of an amplifier is discussed.

Recent Equipment. Under this heading the following new items are reviewed' Communications Associates Inc. CF-6 FSK Converter/Keyer., by K1PLP; and Heath IP-28 Regulated D.C. Supply, by W1KLK

An RC-Active Audio Filter for C.W., W7ZOI Here is the rundown on RC-active filter design W7ZOI gives the basic design information for this type of audio filter and provides practical data for building a highly selective c.w. filter

"RADIO COMMUNICATION"

April 1970—

A Droitwich-Locked Frequency Standard, by GM3TFV Droitwich operating on 200 KHz., supplies a signal which is eminently suitable for this purpose, if you live in the U.K. or in parts of Europe where the station is audible

Living with Silicon. G3PDM A survey of linear integrated circuits and their applications.

Technical Topics, G3VA. Home-built receivers, SIC electronic voltmeter, positive and negative supply, solid state regulated supply, aerialite "supreme" u.h.f. array, triband vertical, variable length monopole, voltage tripler and h.f. facsimile are the subjects discussed by this author

May 1970—

A Direct Conversion Receiver for 14 MHz., C. F. Dorey, BRS16436. There has been considerable interest generated overseas in direct conversion or homodyne receivers which convert directly from the band in use to audio Sensitivity can be made as good as a superhet without major complications. Direct conversion receivers suffer from two major disadvantages and they are lack of selectivity and the audio image. Despite these, they are quite useable for reception of s.s.b. signals.

Put a Transistor in Your Cathode, G3SBA If you wish to modify a low-band taxiphone for 144 MHz. operation an extra stage may be necessary in the multiplier chain. If this is so, use a transistor oscillator and obtain power from an amplifier tube cathode.

Transistorising D.C. to D.C. Converters, by GM3CFL and GM3UDL. The authors describe means of modifying those vibrator circuits so that transistors can be used.

The F.M. System, VK4ZFD. Reprint from December "A.R."

Technical Topics, G3VA. Pat Hawker considers that the introduction of linear integrated circuits has again put receiver design and construction back into the "practical class" for Amateurs. Other subjects covered, SIC audio filters, SIC a.v.c., etc

R.C.A. "HAM TIPS"

December 1969—

A Magnetic-Tape Keying System for Code Recording and Transmission, W2YM With this gadget you can easily record Morse Code on magnetic tape and later use it either at recorded speed or speeded up or slowed down to key a transmitter or for code practice

January 1970—

Ham-Band Charts (Phase Two), K3QAX. Complete listing of F.C.C. allocations, sub-allocations and authorised emissions from 3.5 to 450 MHz. Should be of particular interest to the Dxer who should check local regs. before practicing what is preached

"SHORT WAVE MAGAZINE"

May 1970—

QRP Transceiver for Two Metres, G3ZCZ. Transistorised low power tx/rx for portable operation

Simple S.W.R. Bridge, G3KHC. A design for aerial matching

Adjusting for Resonance. The practical approach. A method of adjusting a G5RV to tune to the right portion of each band is described

Construction of an Outside Shack, G3LXD 6 x 8 x 7 ft. high or twice this size. Inexpensive and cheap to heat during the winter

N.B.F.M. with the HW-29, G3NBU Modification to avoid t.v.i.

"V.H.F. COMMUNICATOR"

May 1970—

A S.S.B. Transceiver with Silicon Transistor Complement, Part 2. The 9 MHz. Transceiver, DL6HA

Stable Reference Voltages, DK1PN If you use varactor tuning you will need a stable low current source. Also used in regulated power supplies.

A Universal V.H.F.-U.H.F. Transmitter for A.M. and F.M., DL3WR. 1.7w. out of transistors at 145 MHz 1w at 433 and 0.5w. at 1296. Varactor multipliers are used above 145 MHz

Field Effect Transistors in the 28/144 MHz. Transverter, DJ6ZZ P.p. FET circuit allows better performance with lower intermodulation products.

A Digital Discriminator Accessory for F.M. Demodulation, DJ4BG Something new for the v.h.f'er to try.

Simple Compact F.A. Stages for Two Metres, DJ4RX Part 2. A p.a. stage with helical inner conductor

Cheap Varactor Diodes for the 70 cm. Transmitter using an EC8020 Tube, DK1PN. Cheap tuning diodes can be used as varactor multipliers at this frequency if you are choosey

Corrections and Improvements to the 9 MHz. S.S.B. Converter with Integrated Circuits, DJ9ZR 005, DJ3VN. Even the best is capable of some improvements.

Review copy of "V.H.F. Communications" from Paul B. Jackson, 27 Minkara Rd., Bayview, N.S.W., 2104.

"73"

May 1970—

"73" Comments on F.C.C's Proposed Repeater Rules, Staff. Passages as proposed could be catastrophic

What Will Become of C.W.? W5TOM What became of the passenger pigeon?

F.M.-A.M. Transmitter-Receiver Aligner, by W3JKL. Two transistors, any band h.f or v.h.f. Simple, useful.

5/8 Wavelength Verticals, WA0NGV. Twice as good as a quarter wave.

The Intelligent Use of Two Metres F.M., K1ZJH It is possible

Flies 18 dB., W2CLU. The October '68 article was better illustrated

A Ham Style Burglar Alarm for the Car, K2JLD. First take two sticks of dynamite, then . . .

Power Supplies from Surplus Components, WB6BIH Cheapskates power supply manual.

R.F., Riviera Style, K9BDJ Quieting Buick's super noise generator

Keep 'Em Cool in KPO Cans, G3KPO. Cheaper than blowing your cool

Towards the Ideal Solid State I.F., K1CLL, Part 2—filter, converter, a.v.c. State of the art for v.h.f

Epoxies for Electronics, W9KKJ Cold solder joints become respectable at last. (Interesting conducting Epoxy that can carry current.)

FET Pre-Amplifiers for V.H.F. Operation, WA4WDK. 20 dB. gain equals 100 times the power

Postage Stamp Transmitter for Six, K1CLL. Shades of Dick Tracy

Getting Your Extra Class Licence, Part 15, Staff R.I. power amps.

The 27 Minute Mobile Noise Limiter, W7SOH. If you build it right, it may last even longer

A Low Band Police Monitor, W8JTT For emergency, CD or SDS use.

A Mobile C.W. Transmitter, W6BLZ. Gives a driver something to do with his two free hands

An F.M. "Best Buy," WA7EMM You have an f.m. editor and f.m. articles.

Science Fairs and Science Education, Staff By the science editor of Radio Today

Try Bigger Knobs for Better Operating Performance, WB2ICV. Tiny knobs cramp your style . . . and fingers.

Note.—Remarks are "73's"

VHF

Sub-Editor ERIC JAMIESON, VK5LP
Forreston, South Australia, 5233.
Closing date for copy 30th of month.

AMATEUR BAND BEACONS

VK4	144.390	VK4VV, 107m. W of Brisbane.
VK5	53.000	VK5VF, Mount Lofty.
	144.800	VK5VF, Mount Lofty
VK6	53.005	VK6VF Tuart Hill.
	53.900	VK6TS, Carnarvon
	144.500	VK6VE, Mount Barker.
	145.000	VK6VF, Tuart Hill.
	435.000	VK6VF (on by arrangement).
VK7	144.900	VK7VF, Devonport.
ZL3	145.000	ZL3VHF, Christchurch.
JA	61.995	JA1IGY, Japan.
W	50.091	WB6KAP, U.S.A.

Further to the stop press item in the last issue re the contact between Doug. VK5KK and Geoff. VS6DA in Hong Kong on 2nd June, 1970, at 2146 E.S.T. via transequatorial scatter. VS6DA used an FTV650 to a 5-element beam, both stations were on s.s.b. with exchanged signals of 5 x 9. Doug. operated on 52.110 MHz and Geoff. on 50.110, split frequency working being necessary as the VS6 allocation is from 50.500 to 51.500 MHz. The stop press item mentioned this may well have been the first VK to VS6 contact, but investigation has proved this not to be so, and I am indebted to Colin VK5RO for information that Bob VS6CJ was heard by him on 30th March, 1958, and was subsequently worked by VK6HK early in April. Nevertheless, it's a contact all of us would like to make and Doug. will be the envy of many. That now brings to 14 countries Doug. has worked on 6 metres, a very outstanding effort indeed.

While still in the north, I was pleased to receive a letter from David VK8AU in Tennant Creek. He reports his location is Nobles Nob, which is about 120 feet above the surrounding countryside, 1,100 feet a.s.l. He is using on 6 metres an FTV650 transverter to HA14 Heathkit Linear, giving about 200 watts p.e.p. An FET converter, and the antenna is a 17 foot long 9 element Swan type Yagi, and is able to hear Doug. VK5KK's signal from Darwin occasionally on c.w. (and vice-versa) using forward scatter techniques, the path distance is 540 miles. On 2 metres, David has an MRSA car-phone and crystals for Channels A, B and 1 and 4, also one for 144 MHz. to transmit on. He has a FET converter and is currently building two stacked 14 element 18 foot long Swan type Yagis, vertically polarised. Contact should be possible with mobile stations up to 70 miles to the south and about 30 miles to the east and north, and would welcome some advance information from anyone travelling through that way.

David's letter was written about the middle of June and reported that at his location anyway the JA signals had largely disappeared for the time being or were very weak. Some t.v. video/sound is ocasionally heard on 50 MHz. The June holiday week-end produced VK2 and VK5 contacts, working a total of eight stations in each area.

And on the subject of the June holiday week-end, mention must be made of the 6th Annual South East Radio Group Convention held at Mt Gambier which as usual was a very happy period for those who made the journey, and were treated to real country-style hospitality. The Group for the first time were operating with their own call sign, VK5SR. About 70 Amateurs attended plus many wives, harmonica and girl-friends. Prizes for the large programme were very evenly distributed, 10 went to VK3 and 9 to VK5. One new event was for the best piece of home-constructed gear, and some excellent equipment was displayed. The prize went to VK3ZKB for his excellent 1296 MHz. gear. The Group were very fortunate in having friendly weather as the Sunday stayed clear and allowed the outside events to be conducted without hindrance.

A point of interest was that early in the afternoon of the Sunday, a brief opening occurred to VK2 when VK2ZHE on 52.525 f.m. net was worked by Tony VK5ZDY using his mobile equipment and quarter wave whip. Signals were not good, but considering his car was sheltering behind a building and the opening was only brief, this was not unexpected. The VK2 no doubt got a shock to find there were others queuing up to work him, but conditions did not allow more than about four contacts to be made.

The Sunday evening highlight of course was the tremendous country-style spread given by the ladies, it's worth going just for that! The chairman of the S.E.R.G., Dale VK5ZER, proposed a vote of thanks to all for their help and attendance. A week-end to be recommended.

From Peter VK2ZPC comes a very up to date statistical return for the VK2 V.h.f./U.h.f. Summer Field Day, run concurrently with the John Moyle National Field Day on 7th and 8th Feb. This is an excellently presented return and one hopes the just rewards for such an effort will be forthcoming. Far too lengthy for inclusion here, but a few points therefrom. AX1ACA/P, the club station of the Canberra Radio Society, was top scorer with 11,075 pts., 10,297 of which were scored on 144 MHz., a very fine effort indeed, and indicates much forward planning. Peter VK2ZKP/P won the 6-hour division with 4,447 pts., which is excellent work, too. I also note there was an overall increase of 39 per cent. in participation compared with the usual mid-winter event (for sure the weather would not be so bleak on some of those mountains—but come to VK5 for the searing temperatures for F.D. operation!). I note also with great interest the use of 10 GHz. successfully by VK2ZNC/P who was running 25 mW. of r.f. to an 8 inch parabola, 40 feet high! Good work, but the report does not say who the other station was in the two-way contact. Peter VK2ZKP/P, near Orange, reported hearing the m.c.w. beacon, VK4VV, for about two hours on 8th Feb., signals to S8, but not VK4 QSOs.

I have been looking over a quite nice Newsletter prepared by the Geelong Amateur Radio and T.V. Club, and which I "stole" whilst at the S.E.R.G. Convention. Although principally of local interest, I did manage to twist someone's arm to have my name put on their mailing list for future issues. Apparently very keen, they meet each week on a Friday night in the clubrooms, Storrer St., East Geelong. I note a paragraph of interest that a new radio club has been formed in Mildura with Noel VK3AGF as the President. I am sure all readers of "Amateur Radio" will wish them every success in their new venture.

Roger VK2ZRH sends a short note which certainly shows how well favoured the eastern States were for 6 metre DX during the March to May period. He writes that F2 was observed every week-end during April, peaking 1300 to 1400 E.S.T., and on no less than 14 occasions either the t.v. sound on 49.750 MHz. from the north or JA signals were heard or worked. So maybe VK5 was just lucky to have one good opening to JA anyway. He reports ZL t.v. very scarce but did peak to S9 on 16th May. Thank you for the letter Roger, it arrived just too late for last month.

I note with interest that Keith VK5ZKG is to have a period in the Antarctic area for 12 months. No other information available at this time, or any details of possible transmitting.

I have received many letters since starting this page, giving me encouragement, but I think the most encouraging has come from Frank VK3OF, who formerly wrote the page in both pre-war and post-war periods. Knowing the difficulties besetting anyone who steps into these ventures, Frank has really made it worthwhile for me, and I am sure he will forgive me for mentioning his letter here. And while on the subject of letters, various Publicity Officers have been appointed by different organisations in other States—or so I have been told in some of the earlier correspondence, but nothing for two months from any of them! I'll leave it at that!

I shall have to leave the notes at this period for this month. The 'flu has really caught up with me at last for over a week now, and with a splitting headache I cannot stand the noise of the typewriter much longer. Please forgive me, we shall have "Meet the Other Man" again next month, the present copy will hold over till then.

Closing with the thought for the month: "Sheepish" The way one feels with the wool pulled over his eyes!" Till next month, 73, Eric VK5LP, The Voice in the Hills.

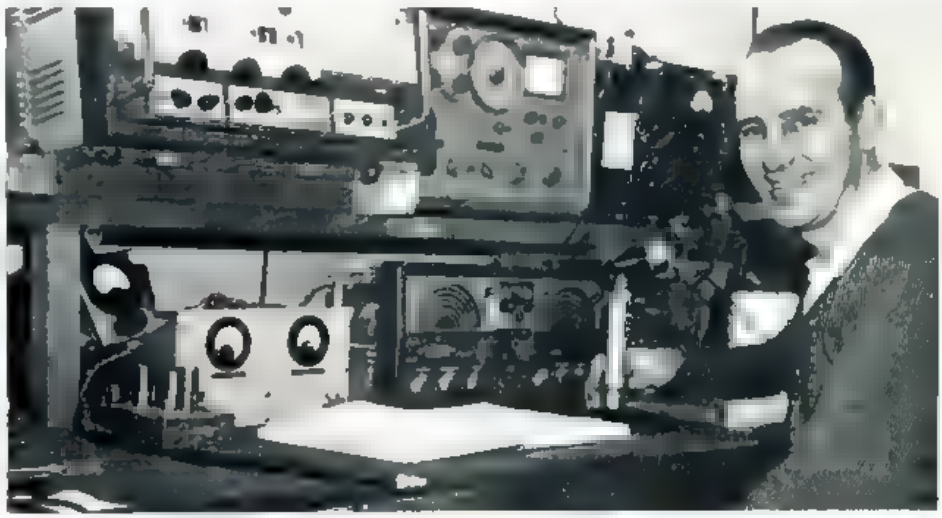
— . . . —

VK5 SUNDAY BROADCASTS

The Sunday morning relay of AX5WI, previously on a frequency of 7148 KHz., is now relayed on a frequency of 7125 KHz.

The broadcast which originates on a frequency of 1815 KHz. at 0900 hours C.S.T each Sunday morning, is also relayed on the following frequencies and bands'—

3625 KHz.—Adelaide
14195 KHz.—Adelaide
52 MHz. Band—Adelaide.
144 MHz. Band—Adelaide.
144 MHz. Band—Mt. Gambier.
144 MHz. Band—Darwin



Bob Lear, VK2ASZ (see "Meet the Other Men" in last month's V.h.f. Notes)

SILENT KEY

It is with deep regret that we record the passing of—

VK2AQR—Robert W. Rose.

COOK BI-CENTENARY AWARD

The following additional stations have qualified for the Award:—

Cert. No.	Call	Cert. No.	Call	Cert. No.	Call
371	AX3ZA	403	JA1BIN	435	W1EJE
372	G3XQC	404	W3HNK	436	VE1JX
373	AX3WW	405	ZM1AWF	437	W5OVU
374	WA6ESB	406	F2MO	438	K1RAW
375	ZS5JM	407	WA5LMG	439	PA0MOD
376	AX4QV	408	W9ZTD	440	WB6OYJ
377	JH1BAY	409	W7ULC	441	AX4YB
378	AX8KA	410	SM0CCE	442	G3WNT
379	VU2VAE	411	ZE1BP	443	K8VIR
380	WA0NTC	412	AX3BCL	444	AX2BGJ
381	AX3JL	413	ZL1AUA	445	G3LDI
382	W1JFG	414	AX2BTM	446	G3MPN
383	WA1KYW	415	I1BGJ	447	K4IEP
384	AX8AI	416	W6YRA	448	W5HAK
385	WA0EAQ	417	W1AIQ	449	G3VQA
386	AX3ADN	418	VE7WJ	450	AX3RV
387	VE8APU	419	WA5ZGI	451	LU6DJX
388	VE3EVU	420	K7RDH	452	WA0UAV
389	W6YGR	421	G3JMB	453	WA0CPX
390	VE3BMB	422	ZM1AOV	454	W6PW
391	PZ1DF	423	VE1IE	455	W4EJM
392	WB9QVP	424	WB2MOI	456	HT1HSM
393	G8AOP	425	AX3UV	457	ZM1ACG
394	W8SET	426	G3JZT	458	G8ZA
395	AX3BAF	427	AX3BBB	459	DJ5FS
396	AX3CT	428	W9DE	460	K2PXX
397	OK3CJE	429	W7YKN	461	YV7AV
398	VE3EWQ	430	ZL3CH	462	G3CSE
399	WA3HDU/M3	431	AX2AXK	463	AX2AEB
400	GM3VAR	432	GC2FMV	464	AX3AHR
401	W2CTL	433	WA3SAM	465	Z35BBP
402	JA3DGC	434	G3SGH	466	G3UKH

—Federal Awards Manager, W.I.A.

Wireless Institute of Australia

Victorian Division

A.O.C.P. CLASS

commences

MONDAY, 7th SEPT., 1970

Theory is held on Tuesday evenings, and Morse and Regulations on Thursday evenings, 8 to 10 p.m.

Persons desirous of being enrolled should communicate with Secretary, W.I.A., Victorian Division, P.O. Box 36, East Melbourne, Vic., 3002.

(Phone 41-3535, 10 a.m. to 3 p.m.)

2nd WORLD R.T.T.Y. CHAMPIONSHIP

The object of this Award is as follows:—

1. To promote greater interest for the r.t.t.y'er taking part in the various r.t.t.y contests.
2. To increase the competitive spirit during the course of the contests held in one year.
3. To make available an Award to the Radio Amateur who has demonstrated his ability to operate r.t.t.y during a period of one year.

At the present time, the contests which count towards this Award are as follows:

1970 B.A.R.T.G. Spring R.t.t.y. Contest.
1970 D.A.R.C. R.t.t.y. W.A.E. Contest
10th World-Wide R.t.t.y DX Sweepstakes.
1970 Alex Volta R.t.t.y. Contest.
1971 Giant R.t.t.y. Flash Contest.

The committees of B.A.R.T.G., the Alex Volta and the Giant R.t.t.y Flash Contest wish to thank the committees of the D.A.R.C. and C.A.R.T.G. Societies for their permission to make use of their own contest scores in arriving at the final scoring for the "World Champion of R.t.t.y." It is hoped that other Societies who organise international contests will join in this idea to increase interest in the R.t.t.y. mode for Radio Amateurs.

In order to arrive at the final score and to decide the winner, the following points system will be used for each contest: 30 points to the winner, 25 points for 2nd place, 22 points for 3rd place, 20 points for 4th place, 18 points for 5th place, 17 points for 6th place, 16 points for 7th place . . . 1 point for 22nd place and all other entrants will be credited with one point.

For the final score for the year, only the best four scores (out of a possible five) will be used for each operator

In order to take part in this Award, it is not necessary for entrants to send in a claim as the entries of all competitors will automatically be included.

The 1970 Championship will start with the 1970 B.A.R.T.G Contest and finish with the 1971 Giant Flash Contest

The 1970 World Champion of R.t.t.y will receive a plaque and prizes will be awarded for the leading positions in the final score. The Italian Magazine "CQ Elettronica" will make available the Awards for each year

It will be the responsibility of the British Amateur Radio Teleprinter Group to nominate the winner for the year 1970 and this Society will notify the "CQ Elettronica" Magazine of the results in order that the Awards can be made.

1970 B.A.R.T.G. CONTEST RESULTS

Only two Australian stations are listed in the results of this contest which were issued on 10th June. First placing went to I1KQ, second to ON4CK, third to SM4CMG, and fourth to VK3FZ. The only other Australian station listed is AX3DM who finished in 41st position.

VK3FZ had 146 contacts on five bands, worked 25 countries for a score of 138,072, whilst AX3DM had 35 contacts on two bands, worked 14 countries for a score of 18,760.

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FOR SALE: Antiference 50 foot self supporting steel Tower, $50. Yaesu FV50 VFO, $27. Yaesu Type F e.s.b. Generator, $20. Both new. 8 Day, 35 Mount St., Glen Waverley, Vic., 3150. Phone 560-9436.

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FOR SALE: Drake R4B Receiver new in carton with handbook and original accessories. $490 or near offer. VK2ABW, E. Baker, 5 Boyce St., Ryde, N.S.W., 2112. Phone Sydney 88-1101.

FOR SALE: Gonset 144 MHz SSB Transceiver with clip-on 110 volt a.c. supply and matching PTT microphone in as-new condition with instruction book, $180. Ian McCosker, P.O. Box 299, Morse, N.S.W., 2400. Phone Morse 522080.

FOR SALE: Lafayette Model HA500 Receiver with manual, near new, $175. Geloso Transmitter, G222-TR, $100. Lafayette Transistor Analyzer, KT223, $20. Multimeter, Model 200H, $10. Kyoritsu SWR Meter, Model K-108, $20. Sansei Miniature Transistorised Test Oscillator, Model TO-3A, $12. Box assorted Valves and Valve Tester, $10. Muhlaisen, 9 Fitzpatrick St., Waroona, W.A.

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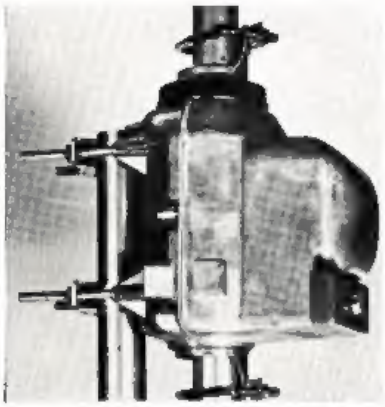

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